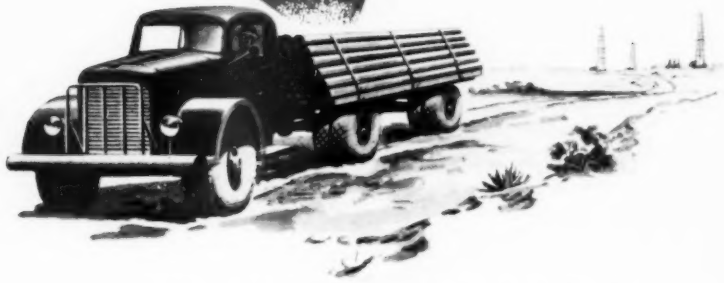
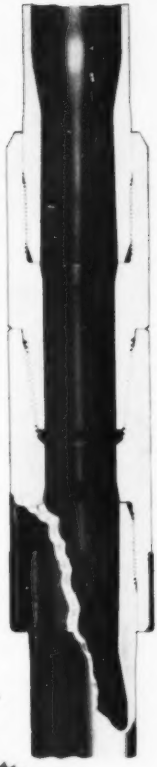
the OIL AND GAS JOURNAL

YOU ELIMINATE THIS WHEN YOU USE...

REED
Super Shrink-Grip
TOOL JOINTS





Being easily replaceable in the field, Reed Super Shrink-Grip Tool Joints eliminate the high transportation costs and lost rig time that result from having to "shop" drill strings for tool joint replacement.

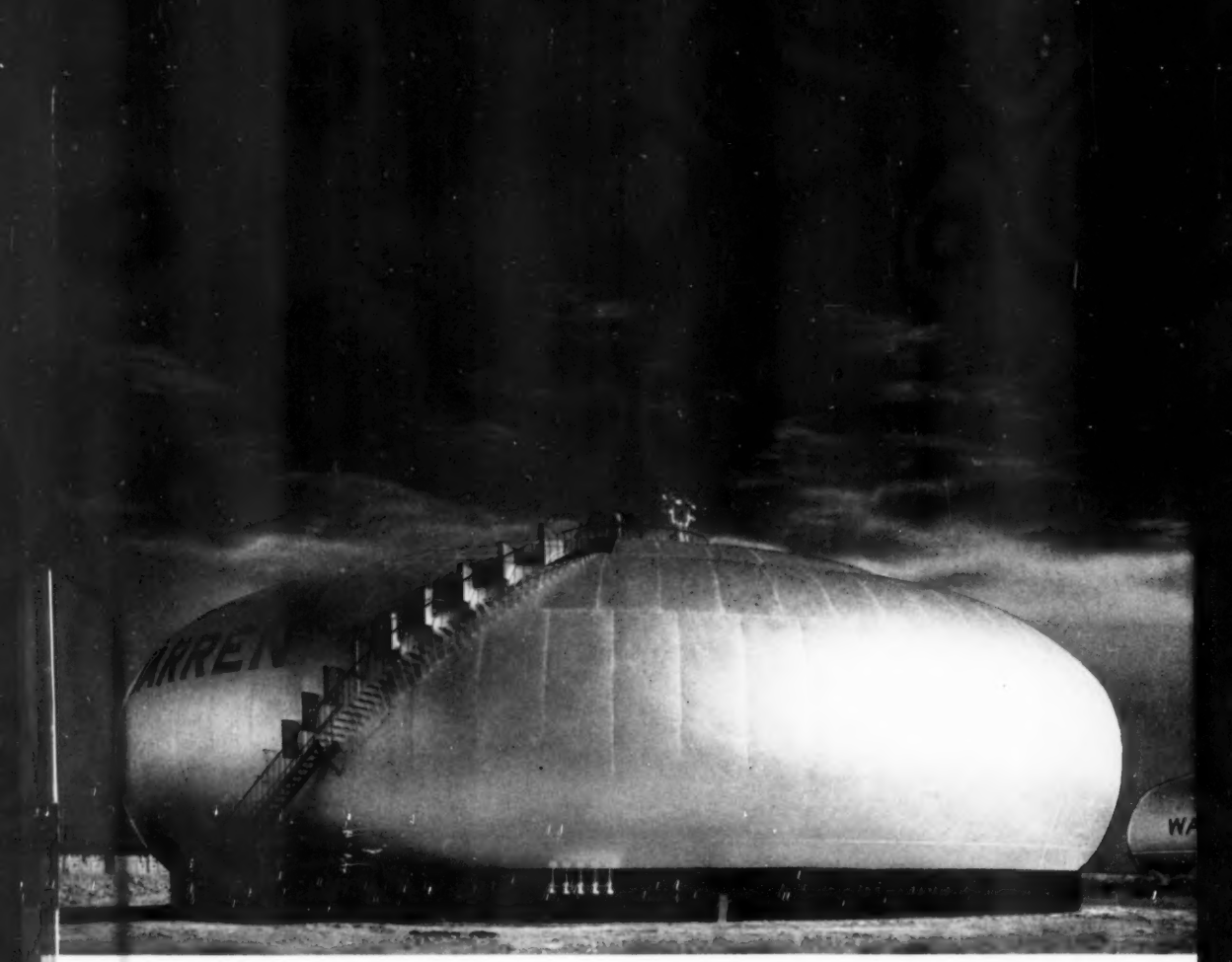
In addition, drill string costs are further reduced because Reed Super Shrink-Grip Tool Joints last longer and are safer.

Be sure your next drill string is equipped with Reed Super Shrink-Grip Tool Joints.

Reed ROLLER BIT COMPANY
HOUSTON 1, TEXAS

BE SAFE WITH REED

PRICE 50 CENTS TABLE OF CONTENTS PAGE 53 JUNE 9, 1949



Tanks that "HOLD THEIR BREATH"

By "holding their breath", Hortonspheroids prevent standing storage evaporation losses from motor fuel, natural gasoline or any other petroleum product that does not boil at atmospheric temperatures. The operating principle behind all this is quickly understandable . . . built to withstand an internal pressure of several pounds per square inch, spheroids make use of the simple fact that no evaporation can take place as long as the pressure in the tank does not exceed the operating pressure for which the tank is designed. Instead of venting vapor to the atmosphere, the pressure in the space above the liquid increases until it is equal to the vapor pressure of the product being stored and then no more of the liquid in the tank vaporizes.

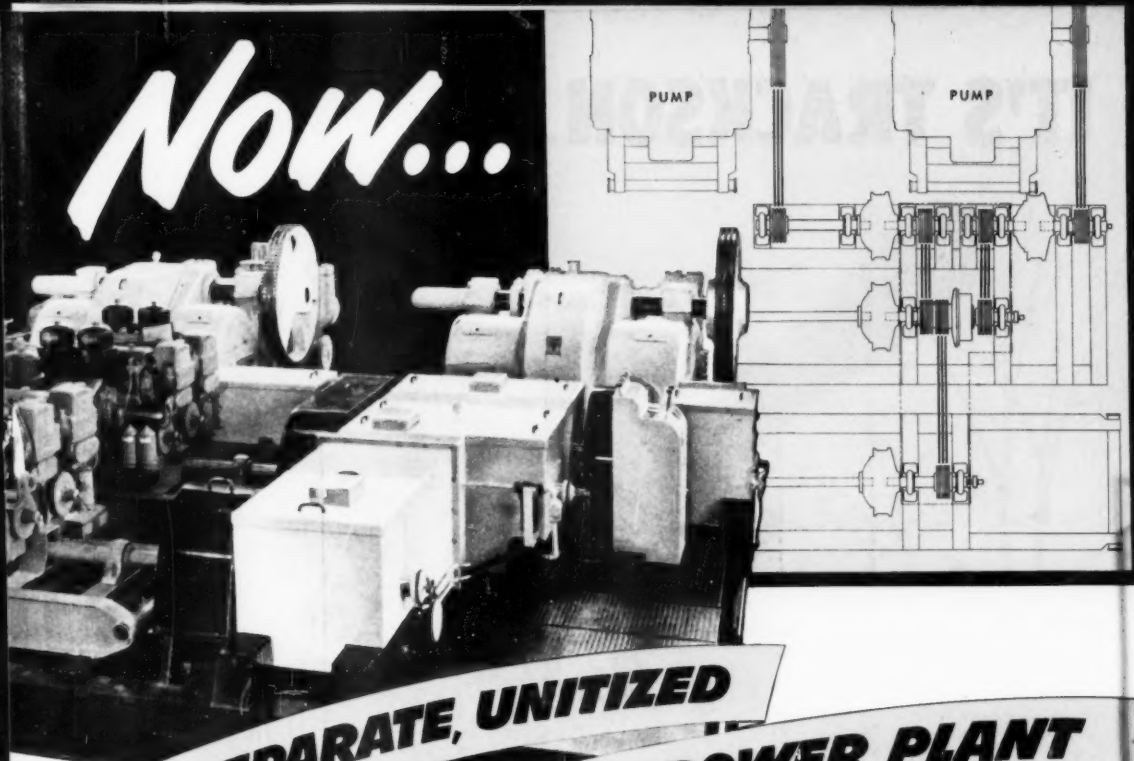
Two important advantages are gained by using Hortonspheroids. First, volumetric loss of liquid is reduced, and second, lowering of volatility is prevented. Thus, the inherent quality of the product being stored is guarded against deterioration.

Noded Hortonspheroids like the one shown above are built in capacities from 20,000 to 120,000 bbls. for pressures from 2½ to 20 pounds per square inch. The smooth Hortonspheroid design is used for capacities from 2,000 to 30,000 bbls. with working pressures from 2½ to 100 lbs. per sq. in. (higher pressures available only in smaller sizes).

CHICAGO BRIDGE & IRON COMPANY

ATLANTA • BIRMINGHAM • BOSTON • CHICAGO • CLEVELAND • DETROIT • HOUSTON
LOS ANGELES • NEW YORK • PHILADELPHIA • SALT LAKE CITY • SAN FRANCISCO • SEATTLE • TULSA

Now...



A SEPARATE, UNITIZED SLUSH PUMP POWER PLANT

Here's a compact slush pump hookup that's completely *independent* of your main drilling engines—a unitized hookup that provides greater flexibility, ample volume and pressure at all times, and a wealth of reserve pumping power.

Shown in the photo are a pair of Bethlehem G-600 pumps, rated for deepest drilling; but other combinations are possible and often desirable. With the layout illustrated, two engines are employed. Both engines can be used at once when super-power is needed; both pumps at once when extra volume is needed. Either engine can drive either pump or *both* pumps. The arrangement is entirely divorced from the draw works—the engines run the pumps only.

Thus there's complete standby protection . . . power in abundance for emergency situations . . . more closely-controlled circulation . . . a greater degree of freedom in placing your pumping equipment.

It's an ideal set-up for marine platform drilling where the platform is small and the pumps are barge-mounted. However, it has many definite advantages for land drilling, too. Full details are available through our nearest sales office; a Bethlehem engineer will be glad to give you the whole story.

BETHLEHEM SUPPLY COMPANY

General Offices: 21 E. Second Street, Tulsa, Okla.

Subsidiary of Bethlehem Steel Corporation

On the Pacific Coast Bethlehem Oil-Field Equipment is sold by Bethlehem Supply Company of California

BETHLEHEM STEEL

IT'S TRACKSON ALL THE WAY!

TEXAS to MILWAUKEE

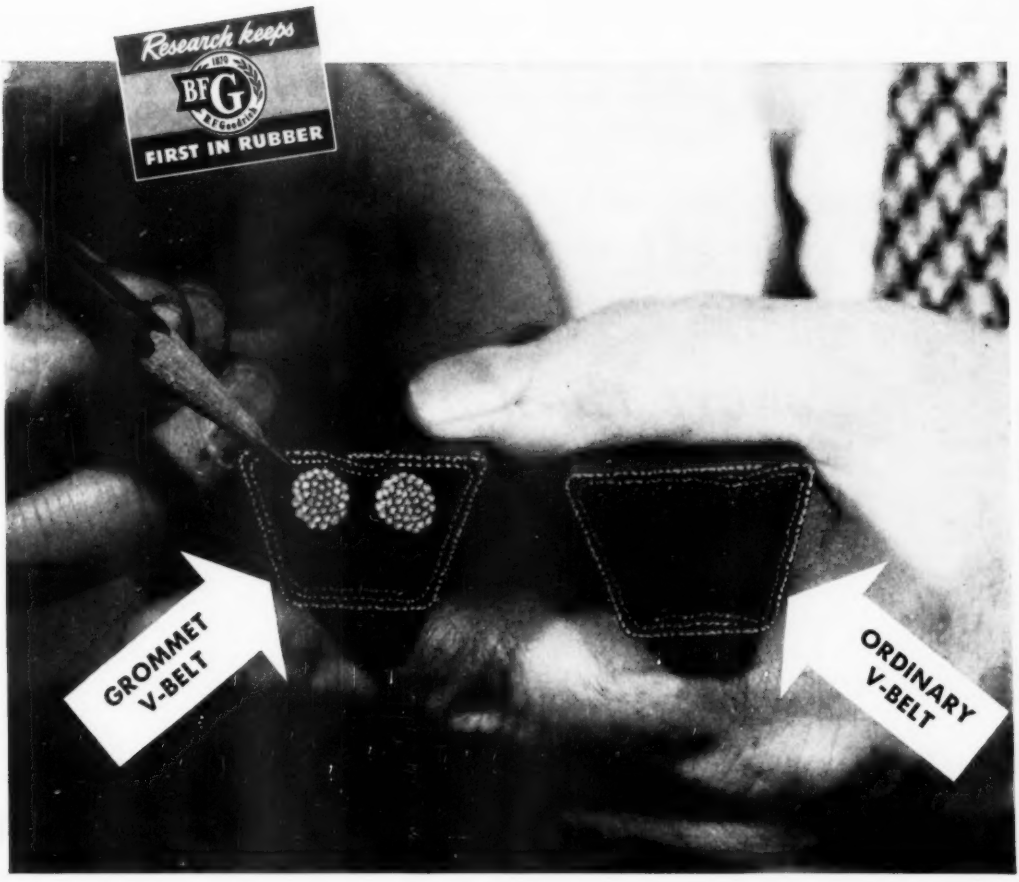
Trackson Pipe Layers In Action!
Tieing-in long section near Milwaukee end.

Laying the hundreds of miles of 24-inch pipe under rugged, cross-country conditions — TRACKSON PIPELINE EQUIPMENT IS THE STAR PERFORMER on the Texas-to-Wisconsin-to-Michigan natural gas line.

- ★ TRACKSON PIPE LAYERS to lift, lower, carry and bend pipe mile after mile.
- ★ TRAXCAVATORS to cut right of way, dig, grade, load and do drawbar work all along the line.
- ★ ANGLEFILLERS to backfill trenches, level, and spread.

That's the TRACKSON PIPELINING package for saving time and making money on every pipe line job. Get the facts from your TRACKSON "Caterpillar" dealer or write direct to TRACKSON COMPANY, Dept. OG69, Milwaukee 1, Wisconsin.

TRACKSON
TRACTOR EQUIPMENT



20 to 50% more V-belt value at no extra price

Exclusive B. F. Goodrich grommet construction cuts belt costs

B. F. GOODRICH grommet V belts are actually a premium belt at *no extra price*, because they deliver more horsepower and outlast ordinary V belts of the same size. Grommet construction (U. S. Patent No. 2,233,294) is the reason these belts give you more for your V-belt dollar.

Higher flexibility, better grip — A grommet is endless, made by winding heavy cord on itself to form an endless loop. It has no overlapping ends (as in an ordinary V-belt cord section), no weakened, stiff section where a "splice" occurs. This means better flexibility, better gripping power — up to ⅓ more power to you!

Concentrated cord strength — All the cord in a grommet V belt is in the twin grommets, placed close to the pulley driving faces for maximum power delivery. There is no wasteful dispersal of cord strength, no uneven load distribution. That is why — size for size — grommet V belts can take heavier shock loads, with a higher safety factor.

20 to 50% longer life — Grommet V belts, tested on multiple drives, actually lasted 20 to 50% longer than ordinary types of Multi-V belts! For one thing, 85% of the failures that occur in ordinary belts at the "splice" section, cannot occur in grommet belts where the cord is *endless*. And all the cords work equally in a grommet belt, no cords overwork. Less heat is generated, cord and adhesion failures are fewer.

Twin grommet construction is a B. F. Goodrich "exclusive". Now made in D and E sizes only. To make sure you get genuine grommet V belts, see your local distributor. *The B. F. Goodrich Company, Industrial and General Products Division, Akron, Ohio.*

Grommet V Belts BY

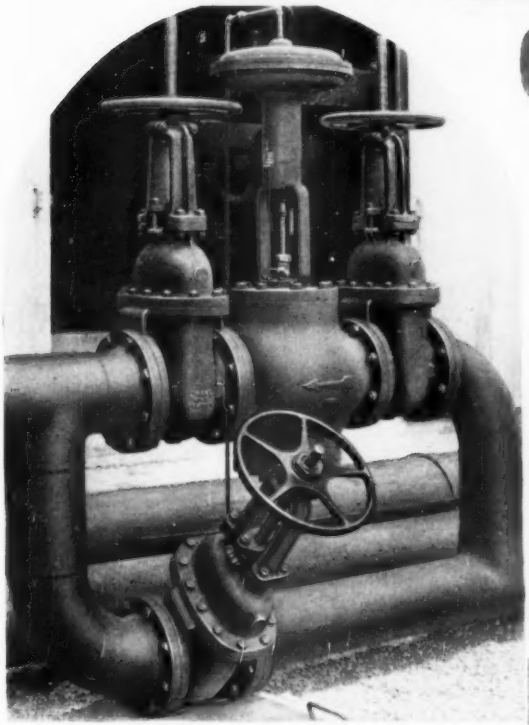
B.F. Goodrich

When you call Schlumberger, you get a log proven by more than a million operations throughout the world.

● Schlumberger's experience in all types of formations . . . in all types of drilling fluids . . . under all well conditions . . . in every part of the world is your added assurance that when you call Schlumberger, you get the best.

SCHLUMBERGER
WELL SURVEYING CORP.
HOUSTON, TEXAS

For better piping down the line
. . . Get <u>everything</u> from CRANE



ONE SOURCE OF SUPPLY
RESPONSIBILITY
STANDARD OF QUALITY

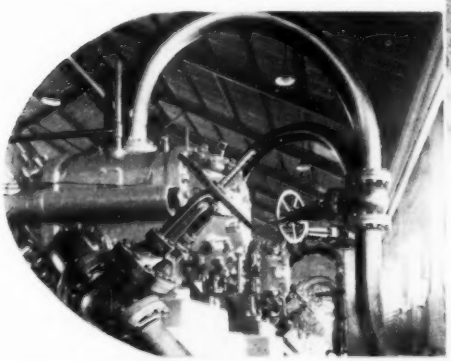
There's no better quality than Crane Quality . . . no, nor any more complete line of valves, fittings, pipe and accessories. That's why you can be sure —when you get **everything** from Crane—of a fast start and a good finish on any piping job. You'll find what you need in one catalog; you'll *get* what you need when you order through your local Crane Branch or Wholesaler.

Since this **One Source of Supply** is the world's most complete, why look elsewhere for the equipment you need? To rely on Crane is to simplify every piping procedure, from design to erection to maintenance. **One Responsibility** for materials helps to give you a better installation, avoids needless and troublesome delays. **Highest Quality** in every item you get from Crane is your surety of better piping performance all down the line.

CRANE CO., 836 S. Michigan Ave., Chicago 5, Ill.
Branches and Wholesalers Serving All Industrial Areas

CRUDE OIL FIELD LINES *showing regulator with Crane standard iron body wedge gate valves in fabricated by-pass arrangement.*

10-IN. PIPE LINE MANIFOLD *featuring Crane iron body gate valves. One order to Crane covers all materials for this installation.*



GAS BOOSTER STATION. *500-pound double-disc gate valves, flanged fittings and pipe bends are from Crane.*

EVERYTHING FROM . . .

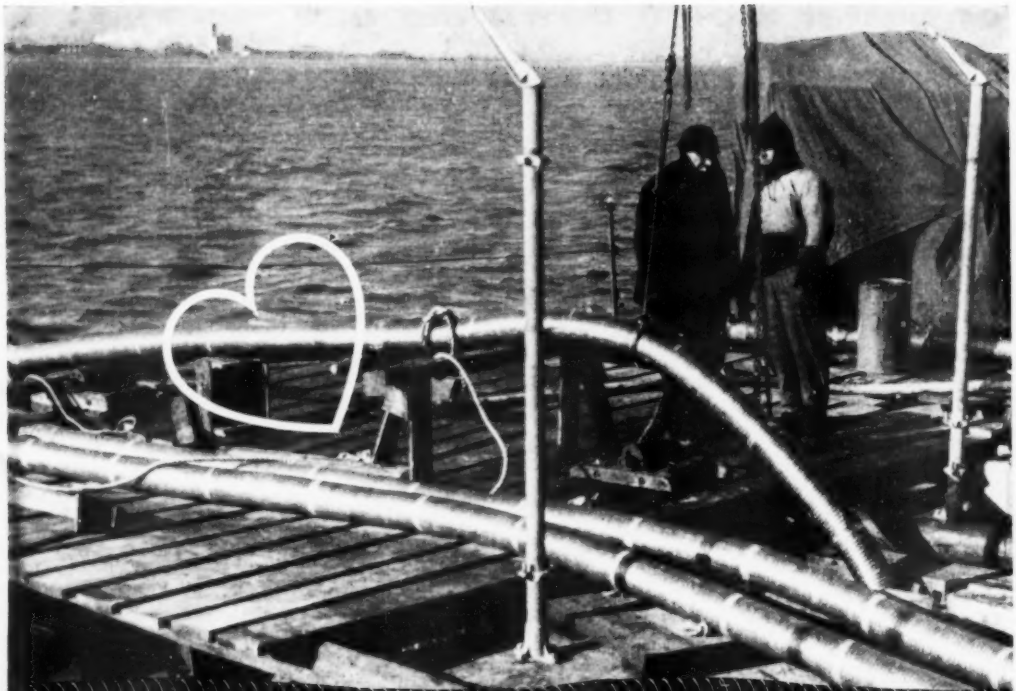
VALVES
FITTINGS
PIPE

CRANE

PLUMBING
AND
HEATING

FOR EVERY PIPING SYSTEM

The Oil and Gas Journal, published Thursdays by The Petroleum Publishing Company. Entered as second-class matter at post office at Tulsa, Okla., under act of March 3, 1879. U. S. and foreign rates to the petroleum industry, $3 yearly. Copyright 1949



BEATS THE HEAT AT CABLE CROSSING

Penflex "Flexineering" helps solve problem of cooling power cables at river crossing

Cooling and protecting eight under-water power cables as they emerge from the water's edge into the shore terminals was a man-sized problem—until Penflex Engineers, teamed with the construction company, furnished the right answer—flexible cooling jackets.

Long sections of 3½" dia. bronze Penflex hose encase each cable from river's edge to the terminal. These were permanently centered in 6" dia. sections of the same length. After sealing both ends of the units, water was circulated through the 6" sections, forming tight, flexible jackets that keep cables cool and protected. Tailor-made by Penflex, these units were easily installed, saving man-hours, cutting costs.

Streamlined for quick service, Penflex "Flexineering" can help solve numerous flexible tubing problems for machine tool manufacturers . . . construction and road building firms . . . oil refineries . . . shipbuilders . . . power plants . . . and other industries.

Backed by 45 years of engineering know-how, Penflex offers complete service on flexible tubing layout design for your specific needs. Call on Penflex for a full line of flexible metallic hose, tubing, and couplings, from ⅛" dia to 30" dia., in all types, for all uses. Also time-saving automatic barrel fillers, rivet passers. For handy bulletins containing complete information, write today to . . .

PENNSYLVANIA FLEXIBLE METALLIC TUBING COMPANY

7213 Powers Lane **Philadelphia 42, Pa.**

BRANCH SALES OFFICES—BOSTON • NEW YORK • CLEVELAND • CHICAGO • HOUSTON • LOS ANGELES

Penflex... HEART OF INDUSTRY'S LIFE LINES

Copyright 1949

Watch the *SPEED* of the TRAVELING BLOCK

with HEAVY-DUTY MURPHY DIESEL POWER

THE real test of an engine on a drilling rig is the way it takes hold of the string when you're coming out of the hole. Because of its hydraulic servo-type governor, the Murphy Diesel seems to know in advance when extra power demands are going to be made—you just can't beat it for responsiveness. By having full rated power available instantaneously you can make more holes faster—it's just like money in the bank.

Write today for full information on Murphy's exclusive combination of design features that make it the leader in economy of operation and ability to stay on the job longer with less down-time.

MURPHY DIESEL

Heavy duty power

for the oilfields

Murphy Diesel Engines and Power Units for drilling and pipeline pumping, 90 to 190 H.P. Diesel-Electric generating Sets 60 to 116 K.W.

MURPHY DIESEL COMPANY
5305 W. Burnham St., Milwaukee 14, Wis.

FACTORY BRANCH—Sales, Parts and Service: 113-117 South Elwood Street, Tulsa, Oklahoma

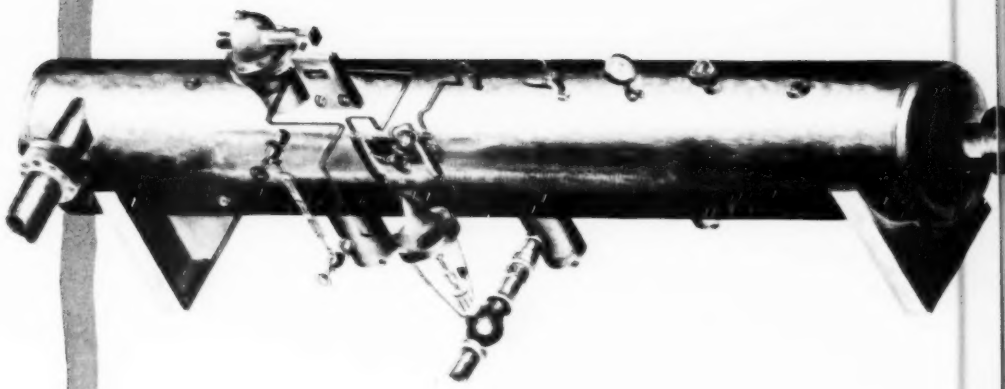
50th birthday of the company whose products you know by the trade-mark: TIMKEN

SINCE 1899 THE TIMKEN ROLLER BEARING COMPANY HAS BEEN HELPING AMERICAN INDUSTRY GET THE MOST FOR ITS MONEY

NOBODY likes to buy a "pig in a poke". In America you don't have to. You're protected by trade-marks like "TIMKEN".

Registered as a trade-mark in the United States Patent Office, "TIMKEN" identifies products made by The Timken Roller Bearing Company: Timken tapered roller bearings, Timken alloy steels and seamless tubing and Timken removable rock bits.

Experience over the years has shown Timken products to be the finest in their respective fields. And many thousands of men and women are working hard to keep them that way. No wonder it has become a habit throughout industry to look for the trade-mark "TIMKEN". The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".



Why is it horizontal?

It's a new BS&B product . . . the horizontal oil and gas separator. Up to now BS&B has built only vertical separators, but there are many good reasons for now adding the horizontal type. Here's why . . .

(1) A horizontal separator of the same diameter can handle more gas than a vertical separator.

(2) High gravity condensate and high pressure gas can be separated faster in the horizontal type.

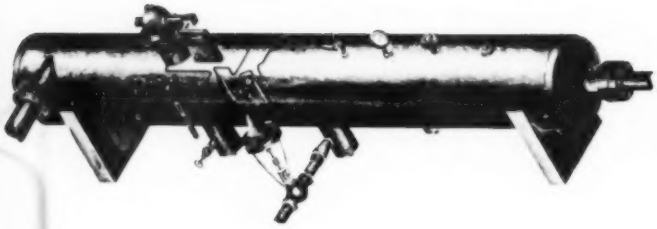
(3) On the basis of capacity per dollar, the horizontal type is thriftier at pressures of 500 p.s.i. and higher.

(4) A horizontal separator is easier to install and hook up.

That's why the horizontal separator "belongs" . . . why it now joins BS&B's growing family of better made products for industry.

BLACK, SIVALLS & BRYSON, INC.

One, two, or three-stage separation with BS&B's new horizontal separators!



Here at last! BS&B brings you one, two, or three-stage separation with a brand new line of horizontal oil and gas separators. Two or three stage separation units are now available as separate vessels or skid-mounted as one unit. Meter runs for one, two or three stages can be mounted alongside the vessels on skids with flow recorder and other instruments mounted in a housing at one end of the skid.

The three stage unit is available with the second and third stages in an integral shell, ten feet long or more. The second stage operating at 250 psi maximum and the third stage operating at 125 psi maximum. The two stage unit will have a second stage with 125 psi maximum working pressure and shell length equal to that of the first stage and same diameter if desired. The second stage, however, can usually be a smaller vessel, minimum diameter of 12 inches.

The new BS&B Horizontal Separator employs torque-tube level controls with pilot controlled oil valves. The standard unit is equipped with gauge glass fittings, pressure gauge, pop valve, companion flanges, gas regulator, drip pots, oil valve and level control. The units are designed to handle fluids free of sediments. Any inquiries should include data on amount of liquid to be expected and the first stage pressure.

BS&B HORIZONTAL SEPARATOR MODELS

Size	Working Presure	Gas Capacity MMSCFD	Liquid Capacity Bbls/day
12" x 10'	500	5.4	540
16" x 10'	500	8.0	800
20" x 12'	500	16.0	1600
24" x 15'	500	22.5	2250
30" x 20'	500	40.5	4050
12" x 10'	1000	9.0	900
16" x 10'	1000	13.5	1350
20" x 12'	1000	22.0	2200
24" x 15'	1000	36.0	3600
30" x 20'	1000	63.0	6300
12" x 10'	1500	10.0	1000
16" x 10'	1500	16.2	1620
20" x 12'	1500	28.0	2800
24" x 15'	1500	40.5	4050
12" x 10'	2000	12.0	1200
16" x 10'	2000	18.0	1800
20" x 12'	2000	28.0	2800
24" x 15'	2000	45.0	4500

BS&B is prepared to design and build any special unit . . . a larger one or one to fit special requirements! Contact your nearest BS&B Sales Engineer TODAY. Or write to:

BLACK, SIVALLS & BRYSON, INC.

OIL FIELD EQUIPMENT DIVISION

Power & Light Bldg. **Kansas City 6, Missouri**

NEW..

Lighter Weight

DIESEL TRACTORS

by AUTOCAR in 2 models

Model DC-74-T and DC-75-T have Gross Vehicle Weight of 36,000 lbs., Gross Combination Weight of 60,000 lbs. Model DC-74-T has a standard axle that gives the chassis a wheelbase of 156". Model DC-75-T has a set-back axle that gives the chassis a wheelbase of 142".

Now you can get the economy and operating advantages of Diesel power in a tractor of lighter weight. Autocar has engineered these new tractors to meet the widespread demand for just such a powerful, economical work unit.

Get the facts, the complete information, the detailed specifications, on these new tractors right away. You may find them the right answer to *your* problem.

To clip costs, clip coupon ➡

THE AUTOCAR COMPANY
Ardmore, Pa.

Please rush the facts about your new lighter-weight Diesel Tractors. No obligation.

Mr._____

Company_____

Address_____

City_____ Zone___ State_____

P.T.M. 173

EXCELALL 179H

POST TRACING PAPERS

ONE FORTY 140

BLUTEX 175H

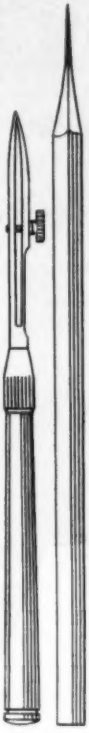
IVORY 167

MADE TO MEET YOUR REQUIREMENTS

Exactly!

Fitting the exact needs of draftsmen and engineers for over half a century, POST has sought to produce the finest product for each problem, purpose or need.

In tracing mediums, POST has perfected a specialized group of 5 papers which they believe exhibit a marked superiority over all competitive products—a superiority so obvious that a single trial is sufficient to establish their use as standard practice in your organization.



TRY

these 5 POST Tracing Papers under your operating conditions. Write for your free samples today — care of P.O. Box 1091, Chicago 90, Ill.

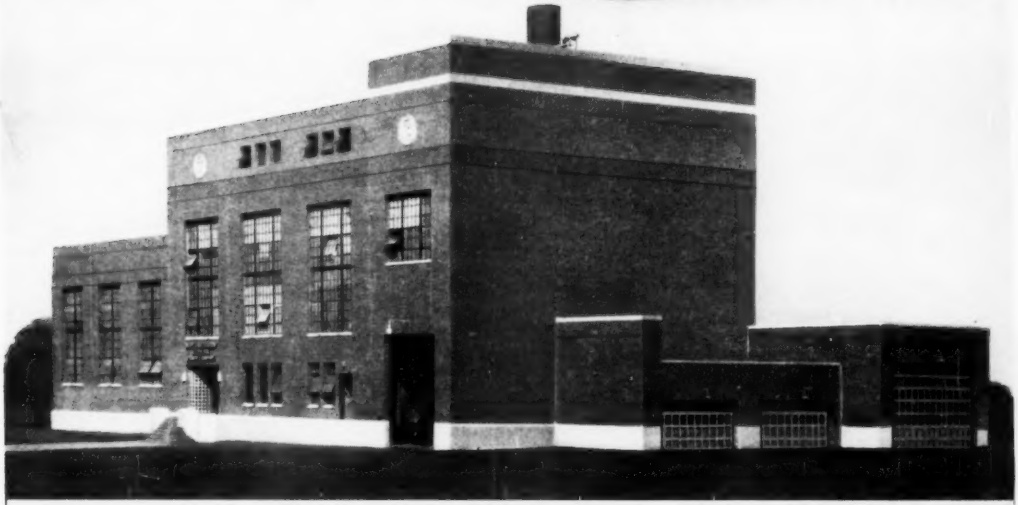
THE FREDERICK POST COMPANY

3650 AVONDALE AVENUE · CHICAGO 18, ILLINOIS · · Houston · Detroit · Chicago · Los Angeles · Milwaukee

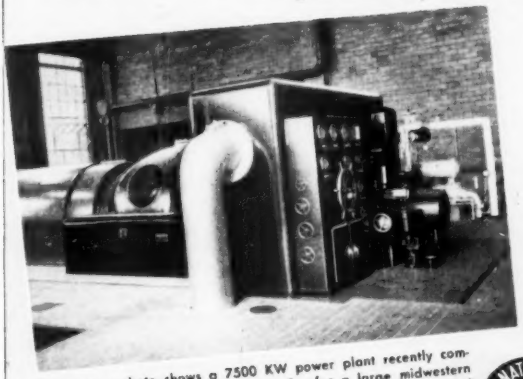
Distributors in all Principal Cities

FOR EVERY PLAN YOU MAKE — — — THERE'S A PAPER BY POST

Pritchard Built **POWER PLANTS***



*Give You Improved Efficiency—Low Cost Power



Top photo shows a 7500 KW power plant recently completed by J. F. Pritchard & Co. for a large midwestern utility. Smaller photo shows a turbo-generator installed in the plant.

Pritchard engineers are thoroughly experienced in constructing power plants in which every detail is designed for more profitable operation. Corporate utilities and industrial users of electric power know that with today's higher labor and supply costs, improved plant efficiency is essential to profit margins. Sound engineering practices, complete design facilities, mutual understanding of your problems and a willingness to cooperate with your engineers, enable Pritchard to achieve that goal for you.

If you are planning any power plants (steam or diesel), generating stations, alterations or expansions it will pay you to consult Pritchard first. Any part of Pritchard's design, engineering and construction service is also available separately. Write TODAY for complete information and competent consultation.

NATIONAL CONSTRUCTORS ASSOCIATION — MEMBER

THREE FUNCTIONS — Design, Engineering, Construction.

J.F. Pco.

FIVE FIELDS — Serving the CHEMICAL, POWER, PETROLEUM and GAS industries as well as providing specialized EQUIPMENT for all industries.

POWER DIVISION

J.F. Pritchard & Co.

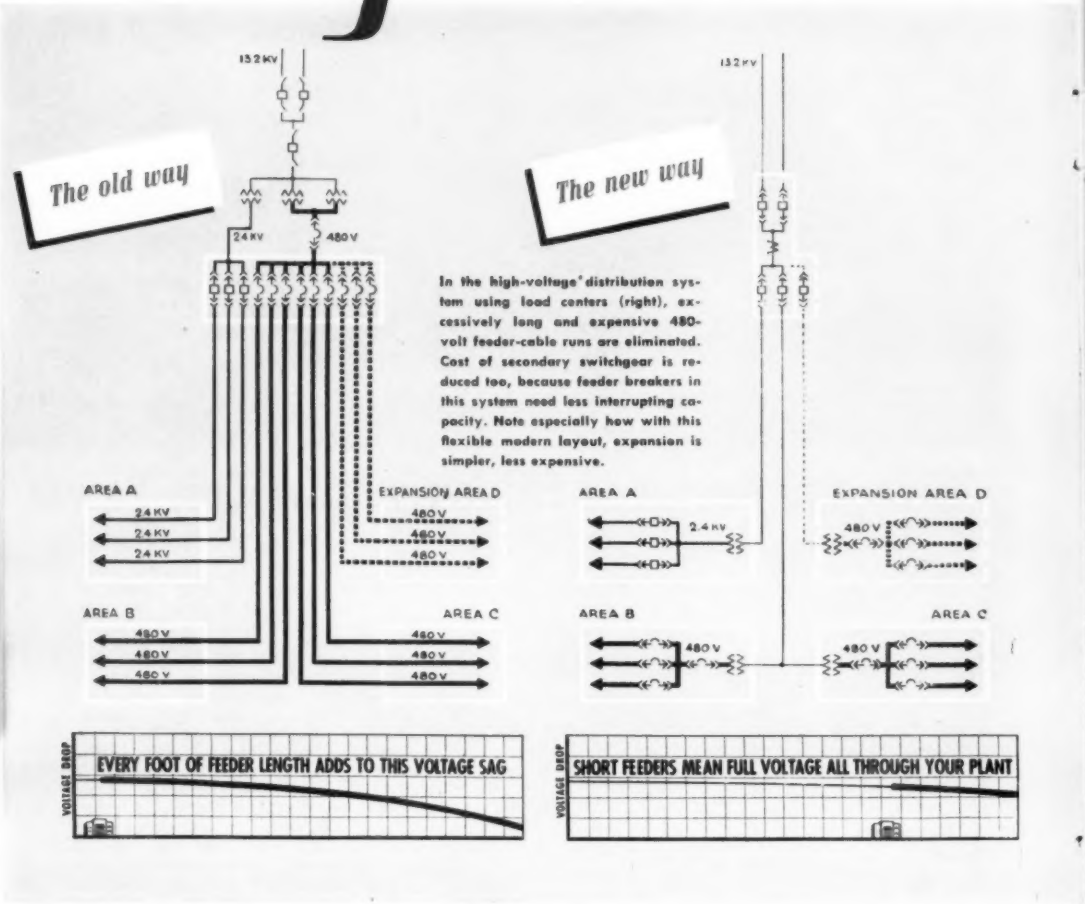
DESIGN • ENGINEERING • CONSTRUCTION

908 GRAND AVE. • KANSAS CITY 6, MO.

HOUSTON • NEW YORK
ST. LOUIS • TULSA • LOS ANGELES • PITTSBURGH • CHICAGO

What's the trend in refinery electrification?

more high-



In the high-voltage distribution system using load centers (right), excessively long and expensive 480-volt feeder-cable runs are eliminated. Cost of secondary switchgear is reduced too, because feeder breakers in this system need less interrupting capacity. Note especially how with this flexible modern layout, expansion is simpler, less expensive.

Here's what you need to modernize your power system!

WHEN YOU COME TO GENERAL ELECTRIC you get far more than the finest in electrical equipment. A General Electric application engineer, familiar with refinery practices, is at your disposal. If desired, he stands ready to take over the job of co-ordinating all the needed components, engineering your power distribution into one modern, efficient system.

voltage distribution

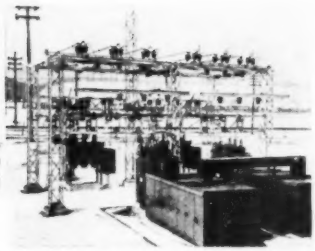
to reduce power losses, cut equipment costs

You see it in more and more refineries today. It's the trend to load-center power distribution. High voltage power is distributed within the plant right to the heart of electrical load areas. There it's stepped down to utilization levels in load-center unit substations and carried to points of use by *short* low-voltage secondary feeders.

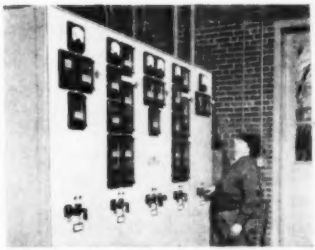
This modern method provides several advantages. By replacing long, low-voltage feeders with short ones, voltage fluctuation is kept within narrow limits, and voltage drop is lessened. This cuts power losses, permits plant equipment to run at full efficiency.

Economies in the cost of cable runs, as well as in the cost of transformers and secondary switchgear, go hand in hand with high-voltage distribution. Plant rearrangements or additions can be made at less cost because of the flexibility of this system. Lower maintenance costs and easier installation are added advantages.

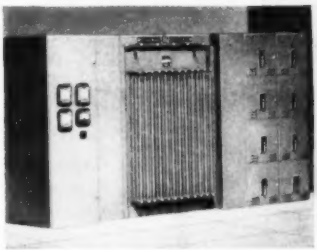
THREE KINDS OF HELP . . . NO OBLIGATION! It's a simple matter for you to get the whole story on how modern refinery power distribution can affect your plant layout, operating continuity, costs. As a service to industry, General Electric offers a 3-point program comprising (1) A fact-filled manual, without sales talk, on plant power distribution; (2) A slidefilm with sound that shows in detail what load-center distribution is and what it does; (3) Illustrated booklets highlighting the main points of manual and film. Write today to have this helpful program made available to you and your staff—without charge or obligation. ***Apparatus Dept., General Electric Company, Schenectady 5, N. Y.***



These completely metal-enclosed G-E package substations are factory-built to fully co-ordinated designs. You save both engineering time and installation time.



In G-E metal-clad switchgear, convenient vertical-lift construction of magne-blast air circuit breakers makes it a quick, easy job to remove them for inspection or maintenance.



Load-center unit substations—compact, fully enclosed, and built from matched components—are complete, easy-to-specify units. Made in flexible combinations, easy to rearrange.

GENERAL ELECTRIC

661-8

COROMAT PROVED UP TO 300% STRONGER BY ACTUAL FIELD TESTS BEFORE EXPERTS

TULSA, April 4—Before a group of 32 pipeline operators, engineers, and owners today, the new, stronger "Coromat"; the improved underground pipe wrap, was announced by Owens-Corning Fiberglas Corporation and demonstrated by their company engineers and by service engineers from Midwestern Engine & Equipment Co., Tulsa, Oklahoma, distributors of Coromat.

Owens-Corning experts explained that the new "Coromat" was developed to meet the need for an inorganic pipe wrap in longer length rolls than heretofore used by the industry and with increased tensile and tear strengths sufficient to allow application by "over-the-ditch" coating and wrapping machines at increased speeds and with fewer starts and stops.

The new "Coromat" material is as much as 300% stronger than conventional-type glass pipe wraps, has up to twice the resistance to transverse tear,

HERE'S HOW NEW, BETTER "COROMAT"

THE IMPROVED UNDERGROUND PIPE WRAP

CUTS COSTS FOR YOU

Your wrapping crews can apply this new stronger "Coromat*" the improved underground pipe wrap *faster* . . . as much as 150% faster. And with practically a zero incidence of breaks in each 400-foot, 800-foot or 1200-foot roll . . . that means less starting and stopping of wrapping machines and less patchwork resulting from such stops. The new "Coromat" is almost 300% stronger than ordinary glass-type pipe wrap material, has specially designed glass-yarn reinforcing that vastly increases resistance to transverse tear.

And you still get all the cost advantages that you have been getting with the previous Fiberglas* Underground Pipe Wrap made by Owens-Corning . . . greater penetration of the wrap by the bitumen, lighter weight than any organic pipe wrap of comparable properties, complete freedom of the glass-mat wrap from rotting, complete inertness to the bitumen coating, and maximum reinforcing of the bitumen coating by the strong glass fibers and yarns that form "Coromat".

"Coromat" is the newest product of Owens-Corning Fiberglas research and engineering, has been tested in the lab and in the field. *Write today* for free samples of "Coromat" and a copy of the technical book "Corrosion Control for Underground Pipe". Write to OWENS-CORNING FIBERGLAS CORPORATION, Dept. 957, Toledo 1, Ohio. Sales offices in 27 leading cities.

FREE SAMPLE

FREE BOOK

OWENS-CORNING
FIBERGLAS

"COROMAT" PIPE WRAP

*Fiberglas (Reg. U. S. Pat. Off.) and Coromat are the trade-marks of Owens-Corning Fiberglas Corporation for products made of or with glass fibers.

How long should an OIL FIELD truck last?

The life of any truck depends upon many things.

It depends upon the miles the truck is driven; on the care taken to keep it in good condition.

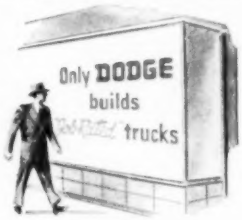
But more than all else, truck life depends on how closely the truck *fits* the job it must do.

Dodge "*Job-Rated*" trucks last longer, and at *low* maintenance cost . . . because they *fit the job.*

It stands to reason that you waste money with a truck that's too big for its job; or, if your trucks are too small for the job, you're in for plenty of costly maintenance expense . . . and early replacement.

From 248 basic chassis models your Dodge dealer can specify a truck that will be "*Job-Rated*" exactly for your hauling job.

Such a truck will have the right one of 7 great truck engines . . . "*Job-Rated*" for top efficiency and economy. It will have the right units throughout . . . to haul *your* loads, over *your* roads.

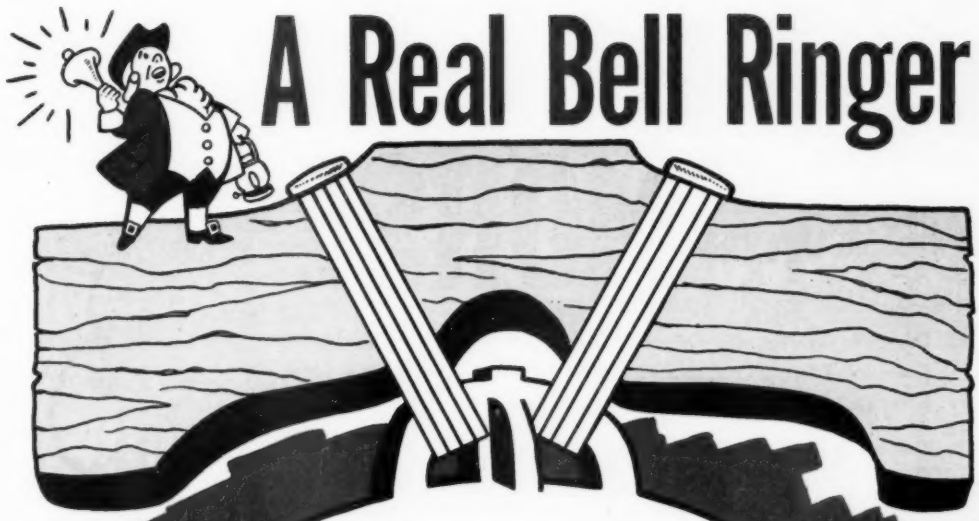


And remember . . . only Dodge builds "*Job-Rated*" trucks. Talk to your Dodge dealer!

For the good of your business—

Switch to DODGE "Job-Rated" TRUCKS

A Real Bell Ringer



in the Pennsylvania Oil Country

your near-by

Jones & Laughlin Supply Store

PENNSYLVANIA
Bradford
Clarion
Pittsburgh (Office)
Pleasantville
Waynesburg

OHIO
Canton
Lodi

WEST VIRGINIA
Clarksburg
Pineville

NEW YORK
Bolivar
New York City (Office)

Like the oil industry itself, the founders of our company started in the Pennsylvania area. How well we have served in Pennsylvania is indicated by the fact that demand has spread our operations through seventeen states to the continental divide.

Your near-by Jones & Laughlin Supply store features interested, efficient, ONE-STOP service. The studied purpose of that store is to make it unprofitable for YOU to do business without it.

Jones & Laughlin Supply Company

Subsidiary: Jones & Laughlin Steel Corporation

J&L STEEL

Stores & Offices in 17 States

General Office

Tulsa, Oklahoma

"Chained" TO DO THE JOB WITH MORSE

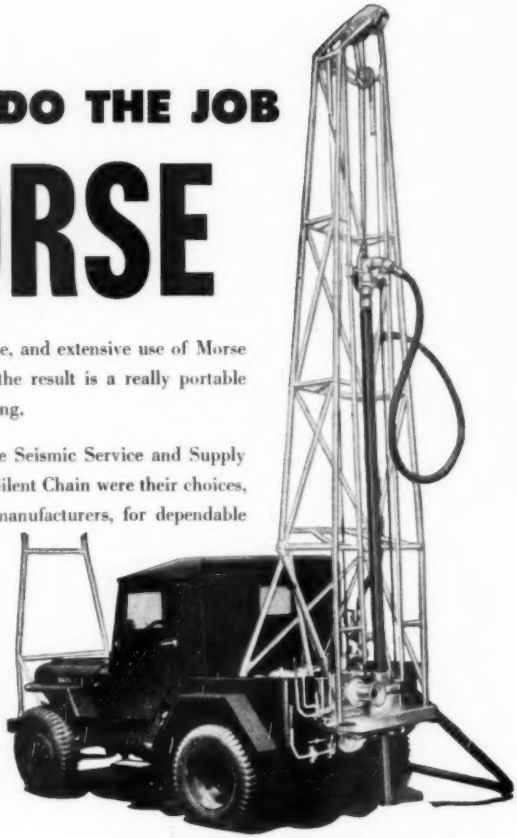
CLEVER engineering, plenty of good common sense, and extensive use of Morse Roller and Silent Chain—put them together and the result is a really portable power drill for shot hole drilling and sample boring.

This compact, rugged unit is manufactured by the Seismic Service and Supply Shop of Houston, Texas. Morse Roller Chain and Silent Chain were their choices, as they are so often with petroleum equipment manufacturers, for dependable chain drives that transmit power efficiently and smoothly in drilling operations.

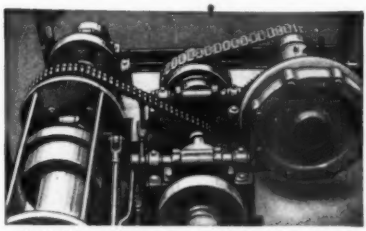
Morse Roller Chain, available in all American Standard pitches and widths, is the ideal chain drive in installations where a low-cost, positive, flexible drive is desired, and where operating conditions are rigorous. Adaptable to long or short centers, slow or relatively high speeds, Morse Roller Chain offers a choice of numerous speed ratios.

Morse Silent Chain is particularly suited for primary drives where higher speeds are encountered.

Morse Silent Chain is made to the new industry standards and therefore fits on all standard sprockets. The over-all efficiency and positive action of Morse Chain Drives have made them the design engineer's favorite method of power transmission. To be properly "chained" for any power transmission drive in the petroleum industry, use Morse Chains. Morse Chain Company, Dept. 364, Detroit 8, Mich.



Light, rugged Model "S" Drill Unit, manufactured by the Seismic Service and Supply Shop of Houston, Texas, rigged for drilling operation, an example of one of the many uses of Morse Power Transmission products in petroleum equipment.



Double ⅝" pitch Morse Roller Chain on secondary drive and hoist drive, and ½" pitch – 2" wide Morse Silent Chain on the primary drive, with guard cover removed for illustration.

MORSE CHAIN COMPANY • DETROIT 8, MICHIGAN

BRANCH OFFICE AND WAREHOUSE, 1308 LA BRANCH, HOUSTON, TEXAS

America's Finest

CUSTOM DESIGNED TRAILER COACHES...

So you want a laboratory right on the job . . . a work shop for tool repairs . . . an office for the men in charge . . . or on the spot living quarters for personnel. Your best solution to these problems is "M" System Trailer Coaches custom designed to meet your specific requirements.

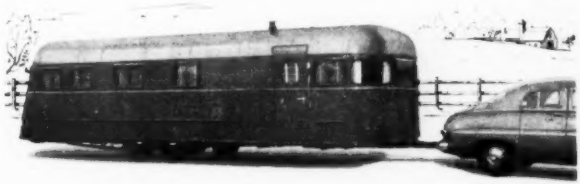
"M" System architects have had a world of experience in designing such specialized types of mobile equipment for oil companies and other industries both in this country and abroad. Today our custom-built trailer coaches are being successfully used in many parts of the world, providing industry with mobile equipment that is saving many valuable production hours and eliminating costly construction.

The new 1949 "M" System catalog illustrates and describes several models of various sizes, anyone of which can be readily adapted to industrial applications. All feature the same rugged construction, all-weather insulation and spacious interior design that have made "M" System trailer coaches famous throughout the world.

Write today for a copy of this new 1949 catalog and put your problems up to "M" System designers for a practical solution. Ask for Catalog M-49.

"M" SYSTEM TRAILER COACHES

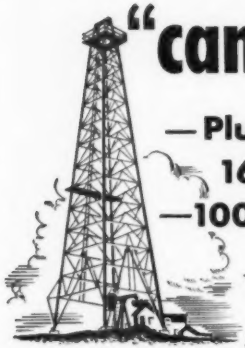
Look for this emblem. It identifies America's finest trailer coaches — "Designed for spacious living."



"M" SYSTEM MANUFACTURING COMPANY • U. S. HIGHWAY 61 N. • VICKSBURG, MISS.

Pump Barrels that "can take it"

—Plunger Travel Up to 160 Thousand Miles —100 Million Reversals



When oil men sink a pump a mile and more deep—it's got to be *tough* and *dependable. Tough* to withstand pressures up to 3 thousand pounds per square inch and shock loads of fifteen thousand pounds per square inch.

Dependable because at such depths there's no chance of maintenance. The only alternative is costly—pull up and replacement.

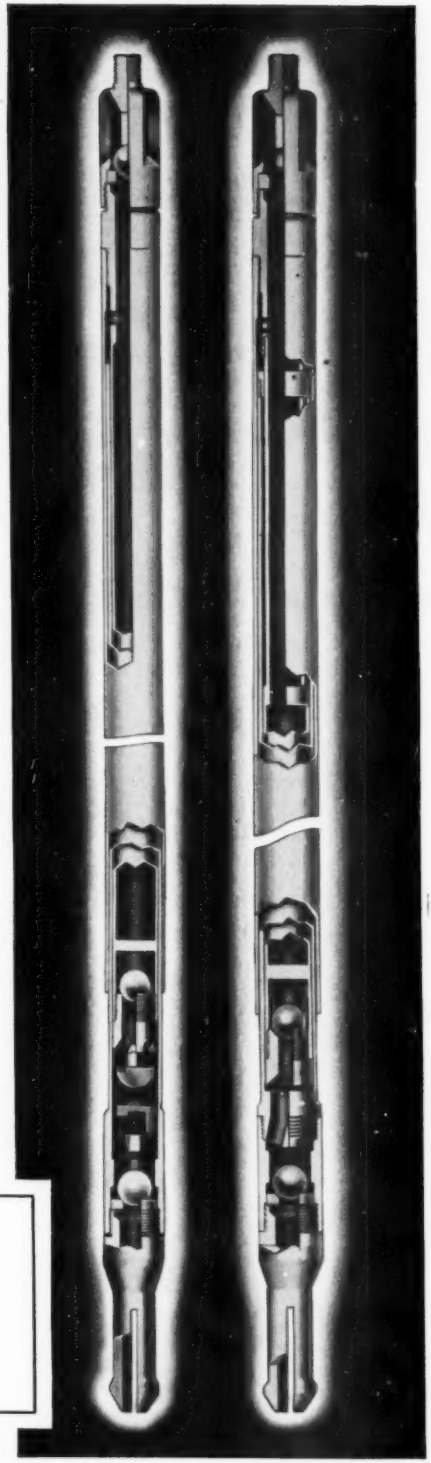
Globe Steel Tubes Company worked closely with the manufacturer of these OILMASTER pumps—developing the exact kind of alloy steel tubing to make these tough dependable oil well pump barrel units.

Globe fabricates these tubes to rigid specifications for the exacting conversion operations involved in producing a uniformly heat-treated and honed one-piece, long length barrel required for OILMASTER oil-well pumps.

Result: *Users regularly report fifty million and more pumping cycles with no breakdowns!* The manufacturer, Fluid Packed Pump Company, simplifies production and gains a superior product.

Decide today to look into the possibilities of Globe Tubes for your products—to cut costs—to simplify production—to improve product design and performance. Write —

GLOBE STEEL TUBES CO.
Milwaukee 4, Wisconsin



Seamless Stainless Steel Tubes
Gloweld Welded Stainless Steel Tubes
Carbon—Alloy—Seamless Steel Tubes
Globeiron Seamless High Purity Ingot Iron Tubes
Globe Welding Fittings

GLOBE
STEEL TUBES

Hydraulic POWER* STEER

TURNS WHEEL Easily

EVEN THOUGH* THE OSHKOSH TRUCK IS STANDING STILL

Even the six year old child (shown above) can turn the big front wheels of an Oshkosh Truck with one hand although the truck is in stationary position. Just a touch of the steering wheel and the hydraulic power steer maneuvers the wheels - - a mighty important factor in soft terrain.

OSHKOSH

4 - and 6 WHEEL DRIVE TRUCKS FOR OIL FIELDS

CABLE ADDRESS: "OSHMOTOR" OSHKOSH

These features combine to make Oshkosh the all purpose truck for oil field use: All Wheel Drive; Hydraulic Power Steer; Maximum Maneuverability; Heavy Duty Oversize Industrial Type Radiator; Sturdy Frames and Axles; Air Actuated Brakes; Rugged Transmissions; Hydraulic Coupling; Powerful Engine.

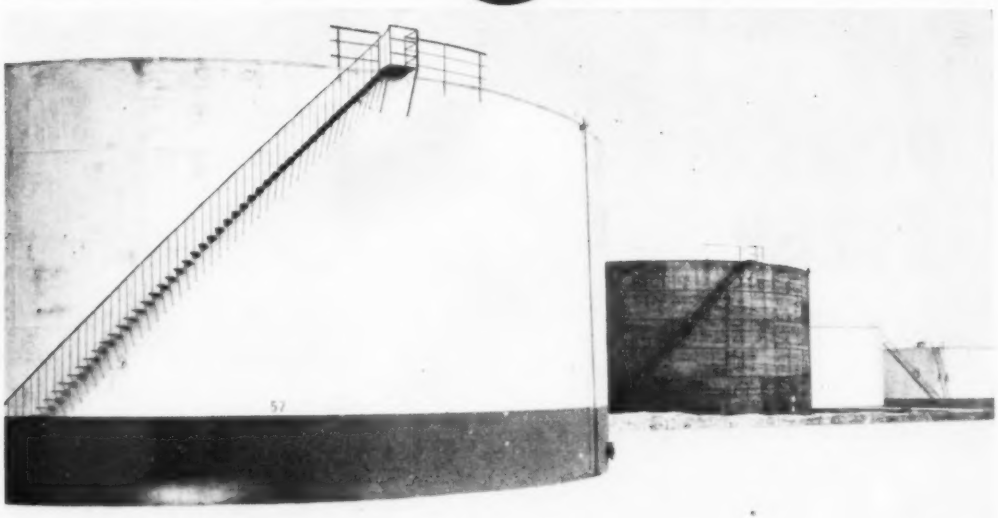
See Oshkosh Mid-Continent representatives for the complete Oshkosh Story.

OSHKOSH MOTOR TRUCK, INC.
OSHKOSH, WISCONSIN

Mid-Continent Representatives

GARDNER-PRICE COMPANY
Wright Building
TULSA, OKLA.

ANOTHER 3M COMPANY SERVICE



TEXAS SOUR CRUDE HOLDERS—The interior of a McElroy Pool storage tank, similar to these and treated with "Coro-Gard" was sound, the coating intact after more than 2 years of sour crude handling.

"Coro-Gard" for lasting protection...non-stop production

What's the BIG difference between "Coro-Gard" and other plastic protective coatings? It's the compounding, which has succeeded in giving "Coro-Gard" long-lasting resistance to the solvents in petroleum—solvents which cause other coatings to embrittle, lose adhesion.

So, more and more, petroleum production men turn to "Coro-Gard" to combat corrosion inside and rust outside of equipment.

"Coro-Gard" does the job, does it well, does it longer than any other plastic anti-corrosion coating. Use it to cut oilfield equipment maintenance costs.

WRITE TODAY for complete information about cutting the cost of treating equipment, prolonging the interval between coating and re-coating. Address our Adhesives and Coatings Division in Detroit.

CORO-GARD BRAND **ANTI-CORROSION COATING**

Made in U.S.A. by MINNESOTA MINING & MFG. CO.
General Offices: St. Paul 6, Minnesota
Adhesives & Coatings Division, 411 Piquette Ave., Detroit 2, Mich.
Also makers of "Scotch" pressure-sensitive tapes, "Underseal", "Scotchlite", "3M" Abrasives, "3M" Adhesives.

General Export: DUREX ABRASIVES CORP., *New Rochelle, N. Y.*
In Canada: CANADIAN DUREX ABRASIVES LTD., *Brantford, Ontario*

New Design Feature
CHAPMAN VALVE
List 960

Gives more than 50% increase in strength of stem and wedge gate connection...meets the most extreme operating conditions.

Valve stems and gates with the new scientifically designed connection are interchangeable with all List 960 Valves now in service

Here's one more result of the year after year program of research which Chapman carries on to make the List 960 *tops for toughness.* Reason why this small gate valve can lower your maintenance cost — give you more years of useful valve life.

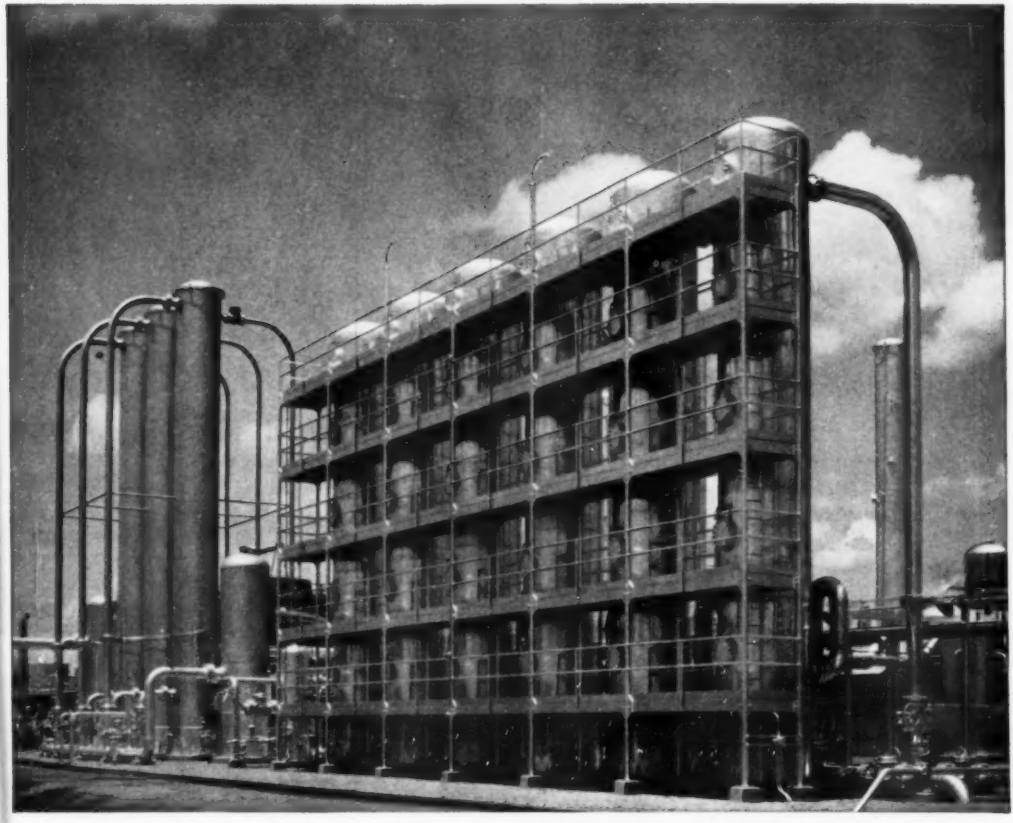
Consistently you will find the Chapman List 960 is *your best valve buy.* It is available in sizes ¼" to 2" . . . rising stem with yoke (as illustrated). Also available rising stem inside screw type. For pressure range 2000 lb. at 100 deg. F., 380 lb. at 1000 deg. F.

For higher pressures specify List 990.

Secret of this 50% increase in strength of the stem and wedge gate connection lies in its new design which compensates at points where excessive stresses can develop.

And don't forget the wear resisting and non-galling properties of the hard heat treated seat rings and the 800 Brinell hardening of the wedge faces by the exclusive Malcomizing Process.

The Chapman Valve Mfg. Co., Indian Orchard, Massachusetts



. . . for tough, long-lasting protection use PITTSBURGH FINISHES!

FOR downright toughness—sheer ability to take it and come back for more—there's nothing else like Pittsburgh Finishes. For no others are formulated more accurately or tested more thoroughly at the factory and in the field to make certain that they are as good as human skill and ingenuity can make them.

Characteristic of such high quality are Pittsburgh's Aluminum Paints and Paint Liquids which have been preferred for many years by the petroleum industry for their durability and heat and light reflection. These finishes have excellent hiding quality. The vehicles they contain are especially formulated to retain the brilliance and leafing of the aluminum pigment upon aging.

Pittsburgh's Aluminum Paints are ready for use without need to mix pigments and vehicle. Pittsburgh's Aluminum Paint Vehicles are available for those who wish to mix vehicle and pigment on the job. These vehicles have excellent stability and can be prepared without encountering trouble caused by early loss of leafing.

Pittsburgh also provides Tankhide and Ironhide for the protection of metal structures as well as other special finishes for service and bulk stations, pumps and drums.

Our wide experience in making coatings for the petroleum industry may be helpful to you—and save you time and money. Call on us for advisory service.

We'll be glad to send you a copy of our new booklet on Aluminum Paints and Paint Vehicles upon request.

• • •

PITTSBURGH PLATE GLASS COMPANY

Industrial Paint Division, Pittsburgh, Pa.

Factories: Milwaukee, Wis.; Newark, N. J.; Springdale, Pa.; Houston, Texas; Los Angeles, Calif.; Portland, Ore. Ditzler Color Division, Detroit, Mich. The Thresher Paint & Varnish Co., Dayton, Ohio. Forbes Finishes Division, Cleveland, Ohio. M. B. Suydam Division, Pittsburgh, Pa.

PITTSBURGH *Industrial* FINISHES

PAINTS • GLASS • CHEMICALS • BRUSHES • PLASTICS

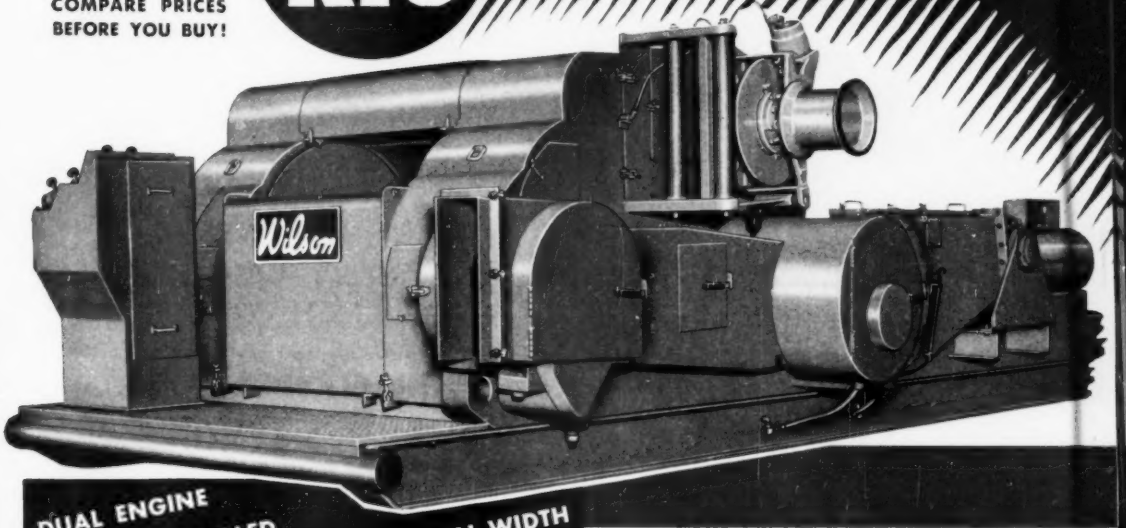
PITTSBURGH PLATE GLASS COMPANY

Wilson

New Roadair GIANT RIG

SENSATIONAL SUPER-FLEXIBLE PERFORMANCE

COMPARE PRICES BEFORE YOU BUY!



DUAL ENGINE
AIR CONTROLLED
ROADABLE! under 12 ft. OVERALL WIDTH

Plus

- WILSON Air-Tube Disc Clutches throughout rig except in the drums and reverse.
- Full width 42" drum, fewer wraps on line.
- Water-cooled circulating brakes, finest!
- Low speed ratio, one engine will pull out pipe from 7500-foot depth, if air fails.

RATED CAPACITY { 7500 Ft. using 4½" drill pipe. / 9000 Ft. using 3½" drill pipe.

More flexibility than ever! Packaged for simpler portability! Full panel air control placed for efficiency! WILSON ROADAIR GIANT RIG incorporates operating and dimensional standards gleaned by the WILSON FIELD STAFF from operators and crewmen. In the ROADAIR RIG, WILSON introduces radical departure in drilling rig design . . . and WILSON know how MAKES IT WORK! WILSON ROADAIR GIANT RIG meets standard road requirements. The low headboard design is just another example of WILSON recognition and pioneering of design in the heavy machinery field . . . no high vision-obstructing headboard to cut off the full view of driller stationed at the control panel! This and numerous other features make ROADAIR the crews' choice . . . that certainly should be good enough for you. Be sure to get full details before you sign up for any rig. Write today for Bulletin 173—it's just off the press!

Wilson

MANUFACTURING CO., INC.
WICHITA FALLS • TEXAS

Pacific Coast Distributor—Power Rig & Equipment Co.—Los Angeles, California • Export Agents—Guy E. Daniels—30 Rockefeller Plaza—New York City • Langley y Cia, Corrientes 1115, Buenos Aires, Argentina—TA-35, Libertad 9535

SODA ASH ★ CAUSTIC SODA ★ CHLORINE ★ BICHROMATES ★ BICARBONATE OF SODA ★ SILICATE OF SODA

Chemicals you live by

YOUR BEST FRIENDS WOULD TELL YOU!

If your gasoline ever gurgled from the pumps with the bad breath nature gave it, your customers would tell you—quickly enough. That's why deodorization is an important part of refining.

A lot of product-proud oil companies treat their gasoline and lube oil for halitosis with DIAMOND Caustic Soda and Chlorine. And in this treatment they get a purer product, free from undesirable odors.

DIAMOND ALKALI's stake in the oil industry includes chemicals for other uses, too . . . Soda Ash to keep miles of piping free from scale and sediment. Bichromates which put a hex on corrosion, Silicates for cat cracking and Bicarbonate of Soda for fire-fighting.

It's not just our products that oil companies like. They're also pleased with our service and the help they can get when they need it from DIAMOND's Technical Service Division. If you'd like further information, why not get in touch with your nearest DIAMOND Sales Office today?

DIAMOND SALES OFFICES: Boston, New York, Philadelphia, Pittsburgh, Cleveland, Cincinnati, Chicago, St. Louis, Memphis, Wichita, Oklahoma City and Houston. Also representatives in other principal cities in the United States.

DIAMOND CHEMICALS FOR THE OIL INDUSTRY

DIAMOND ALKALI COMPANY...CLEVELAND 14, OHIO

DIAMOND ALKALI CHEMICALS

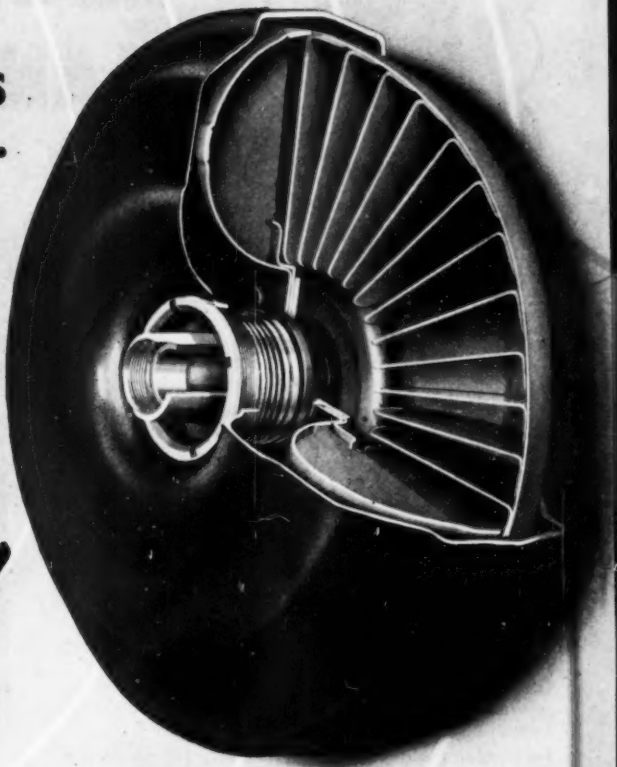
Great News from Chrysler!

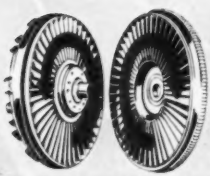
CHRYSLER INDUSTRIAL ENGINES now available with...

gyrol Fluid Drive

at Amazingly Little Cost!

Actually only slightly more than the conventional flywheel which it replaces.





Driver and Runner flywheels are shaped like shallow bowls fitted inside with fins. They operate as separate units, with no mechanical connection—no metal-to-metal contact.

As the Driver turns inside the sealed steel drum, the confined oil produces a powerful swirling out-thrust. Instantly, the Runner receives the impulsion and transmits smooth power to the load.

The coupling is an integral unit. No adjustments are necessary. Oil maintains required fluidity over a wide temperature range. Remains unaffected by seasonal temperature changes.

PROVED on more than a *million* Chrysler, DeSoto and Dodge passenger cars and trucks over a period of 11 years.

PROVED on thousands of industrial jobs—scores of applications under rugged field conditions.

Chrysler's famous Fluid Coupling opens a whole new field for the improved operation of power equipment! A way to reduce excessive clutch wear! A way to protect equipment from damaging shock overloads! A way to get gradual *oil-smooth* acceleration. A way to assure better performance, longer wear and lower upkeep. A way to secure many other advantages peculiar to your equipment. *—at negligible small cost!*

Tell us your needs. See your Chrysler Industrial Engine dealer or write us. Parts and service quickly available everywhere. ***Industrial Engine Division, Chrysler Corporation, Detroit 31, Michigan.***

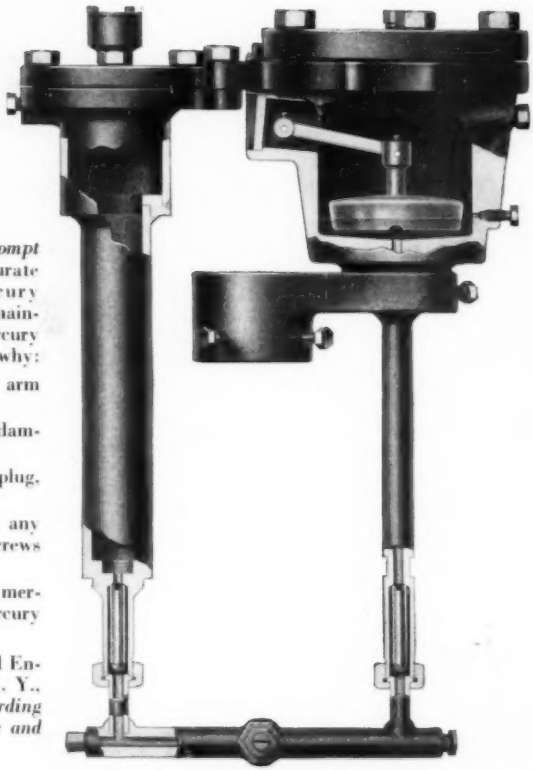
CHRYSLER

Industrial Engines and Power Units

HORSEPOWER WITH A PEDIGREE

New Taylor Mercury Manometer is

MAINTENANCE MAN'S DREAM!



Now you can have *prompt* delivery on this accurate new Taylor 1500 Mercury Manometer. It's easier to maintain than any other mercury manometer—and here's why:

(a) ***Easy to calibrate*** by reaching float and lever arm through top of pressure chamber.

(b) ***Easy to replace*** pressure-tight bearing without damage if ever required.

(c) ***Easy to fill***—vent valves in cover, mercury level plug, built-in mercury funnel, bull's eye level.

(d) ***It's easy to fit*** Manometer on pipe support in any position—and in accurate alignment—thanks to set screws instead of threads.

(e) ***And to change range*** you simply: **(1)** Drain mercury, **(2)** Take out old range tube, **(3)** Fill with mercury to sight level, **(4)** Re-zero.

Write for Bulletin 98182, or ask your Taylor Field Engineer. Taylor Instrument Companies, Rochester, N. Y., or Toronto, Canada. *Instruments for indicating, recording and controlling temperature, pressure, humidity, flow and liquid level.*

QUICK FACTS FOR THE ENGINEER

1. ***High Accuracy***—Inherent straight line calibration.

2. ***Floating Power***—great power made possible by large float and long travel, transmitted by non-corroding "Teflon" bearing which "floats" power through to the pen.

3. ***Positive Actuation***—High energy output. **(a)** ***Big 3¼" float.*** **(b)** ***Long travel of float—1".*** **(c)** ***Simple lever system.*** Stainless steel lever arm fastened to flat of pressure-tight bearing shaft with screw. **(d)** ***Teflon in pressure-tight bearing surfaces*** assures efficient use of power because: Teflon bearing, micro-finished shaft, silicone lubricant give unprecedented performance—leakless, and negligible friction under high working pressures. Union coupling on bearing housing prevents distortion of bearing and binding of shaft. **(e)** ***Jewelled thrust bearing.***

4. ***"Dependable Performance"*** **(a)** ***Submerged check valves.*** **(b)** ***Unique damping valve*** easily adjusted under full pressure without leakage. **(c)** ***Ample capacity*** in mercury chambers to accommodate effects of surges or pulsating flows. **(d)** ***Teflon holds pressure,*** yet allows shaft to rotate freely and assure long, dependable service.

5. ***"Great Adaptability"*** **(a)** ***Six interchangeable range tubes:*** 10", 20", 50", 100", 200", and 400" of water. **(b)** ***Tubes can be easily changed*** in field without piping alterations.

TAYLOR INSTRUMENTS MEAN ACCURACY FIRST

Bovaird

can help you get down to business

. . . with the equipment and supplies you need on your job — whether it is drilling, producing, pipe line or refining. Ample stocks are readily available at Bovaird stores strategically located in Illinois, Kansas, Oklahoma and Texas. You will find Bovaird personnel fully acquainted with field conditions and up-to-date equipment. And they have an earnest desire to help you facilitate your operations in any phase of the oil business.

SUPPLY BOVAIRD COMPANY

OFFICES AND STORES

ILLINOIS—Clay City, Grayville, Salem
KANSAS—Chase, McPherson, Pratt, Russell, Wichita
OKLAHOMA—Duncan, Oklahoma City, Pauls Valley, Sapulpa, Seminole
TEXAS—Borger, Dallas, Odessa, Pampa

"Buy From Bovaird"

THE BOVAIRD SUPPLY CO.

GENERAL OFFICES: TULSA, OKLAHOMA

WELL AFTER WELL

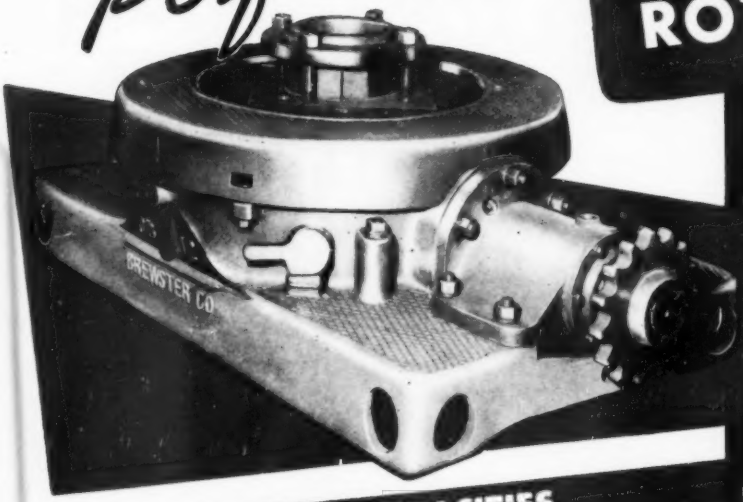
FIELD AFTER FIELD

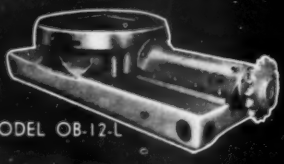
YEAR AFTER YEAR

Superior Performance

BREWSTER

MODEL OB ROTARIES





MODEL OB-12-L

MODEL OB-12-S

Compact, and rugged, the OB-12-S has all the engineering features of the larger OB rotary models. Full 12" table opening. C/L of table to C/L of sprocket is only 29"

MODEL OB-18

MODEL OB-22

AMPLE BEARING CAPACITIES

FAST SAFE TABLE LOCKS

LARGE OIL RESERVOIRS

4 MODELS—3 SIZES

BREWSTER MODEL OB ROTARIES	OB-12-S	OB-12-L	OB-18	OB-22
Table Opening	12"	12"	18"	22"
Rated Deadload Capacity	100 tons	100 tons	167 tons	265 tons
Recommended Drilling Depth (with 4½" pipe)	3,000'	3,000'	6,000'	10,000'
Gear Ratio	4:1	4:1	4:1	3.03:1
Recommended Max. Table RPM	300	300	300	300

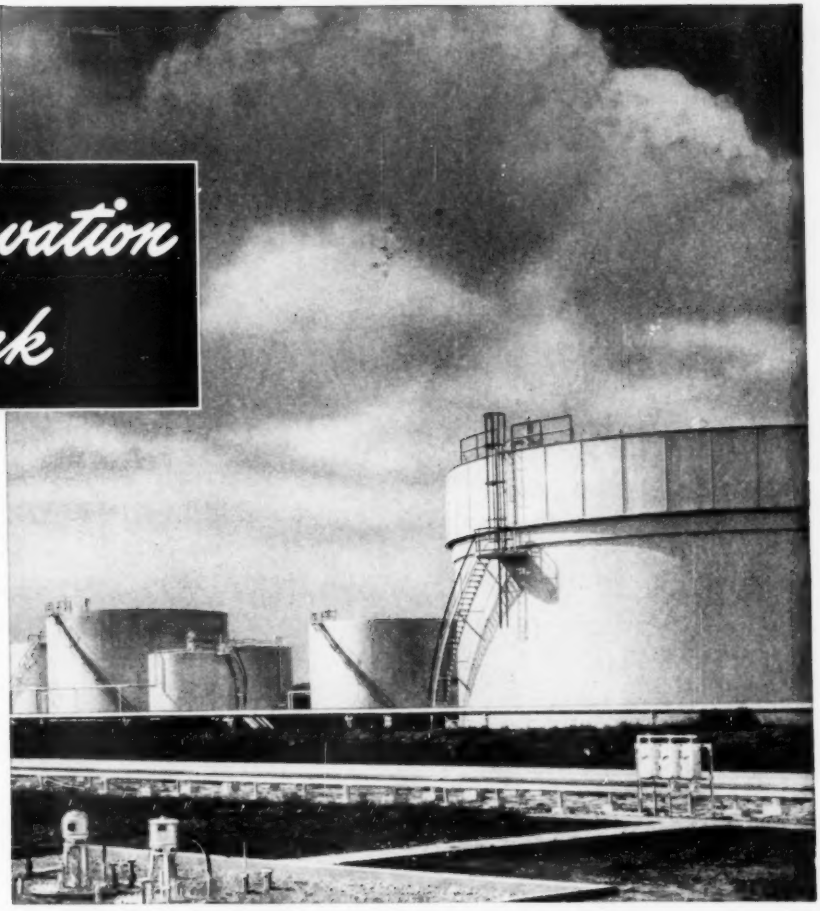
Table bearings: Angular contact roller bearings.
Pinion shaft: Double-row tapered roller bearings.

Write for Catalog L

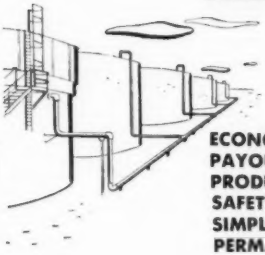
THE BREWSTER CO., INC.
Manufacturers of Drilling Equipment Since 1910
SHREVEPORT, LOUISIANA, U.S.A.

BREWSTER
Drilling Equipment

Conservation at work



THE EXPANSION ROOF STOPS PROFIT LEAKS



Narrowing margins demand optimum operating economy wherever petroleum products are stored. That's why producers, refiners and marketers alike have turned to the Expansion Roof. Here's what it means to them:

ECONOMY . . . The end of evaporation losses
PAYOUT . . . Protection of multiple tank installations through manifolding
PRODUCT QUALITY . . . Maintenance of quality during the storage period
SAFETY . . . Reduced fire hazard, Underwriters' approved
SIMPLICITY . . . No problem of maintenance
PERMANENCE . . . No parts to wear, the Expansion Roof will last the life of the tank

In the face of narrowing margins, call on Graver today. Our engineers will analyze your storage problems without obligation and show you how the Expansion Roof can stop your profit leaks.

FABRICATED PLATE DIVISION

GRAVER

GRAVER TANK & MFG. CO., INC.

EAST CHICAGO, INDIANA

NEW YORK • PHILADELPHIA • CHICAGO • CATASAUQUA, PA. • HOUSTON • SAND SPRINGS, OKLA.

PROOF - *not Guesswork*

Makes FWD America's Foremost Heavy-Duty Truck

Here's actual operating proof in oil field service. This FWD — twisting over rough off-the-road terrain to get to location — is doing a regular job for one of the nation's leading oil companies. Going such as this demands trucks that get you there. It demands trucks you can rely on every day. It demands FWDs.

Yes— you can be sure with an FWD even before you buy. Here's why. FWD trucks are scientifically tested on FWD's proving ground to twist over ditches — 18 inches deep. *No wonder many of the world's leading oil field operators standardize on FWDs with individual fleets of over 600 units.*

WHAT FWDs DO ON THE PROVING GROUND
1 Highball over hilly curved roads!
2 Slog thru mud — up to the bumper!
3 Speed over 100-ft. unbanked circle!
4 Twist over ditches — 18 inches deep!
5 Drive up 6% grade thru 3-ft. of sand!
6 Climb 70% grade from dead stop!
7 Climb 8-in. beam from standstill!
8 Drill pole holes to prove equipment!
9 Speed safely over level highways!
1
2
3
4
5
6
7
8
9

This is FWD's proving ground. This is your assurance that the FWD you select has the stamina to insure long life without expensive mechanical breakdowns.

An FWD twists over 18-inch ditches on the proving ground. For all the facts, see your FWD distributor— or write FWD direct.

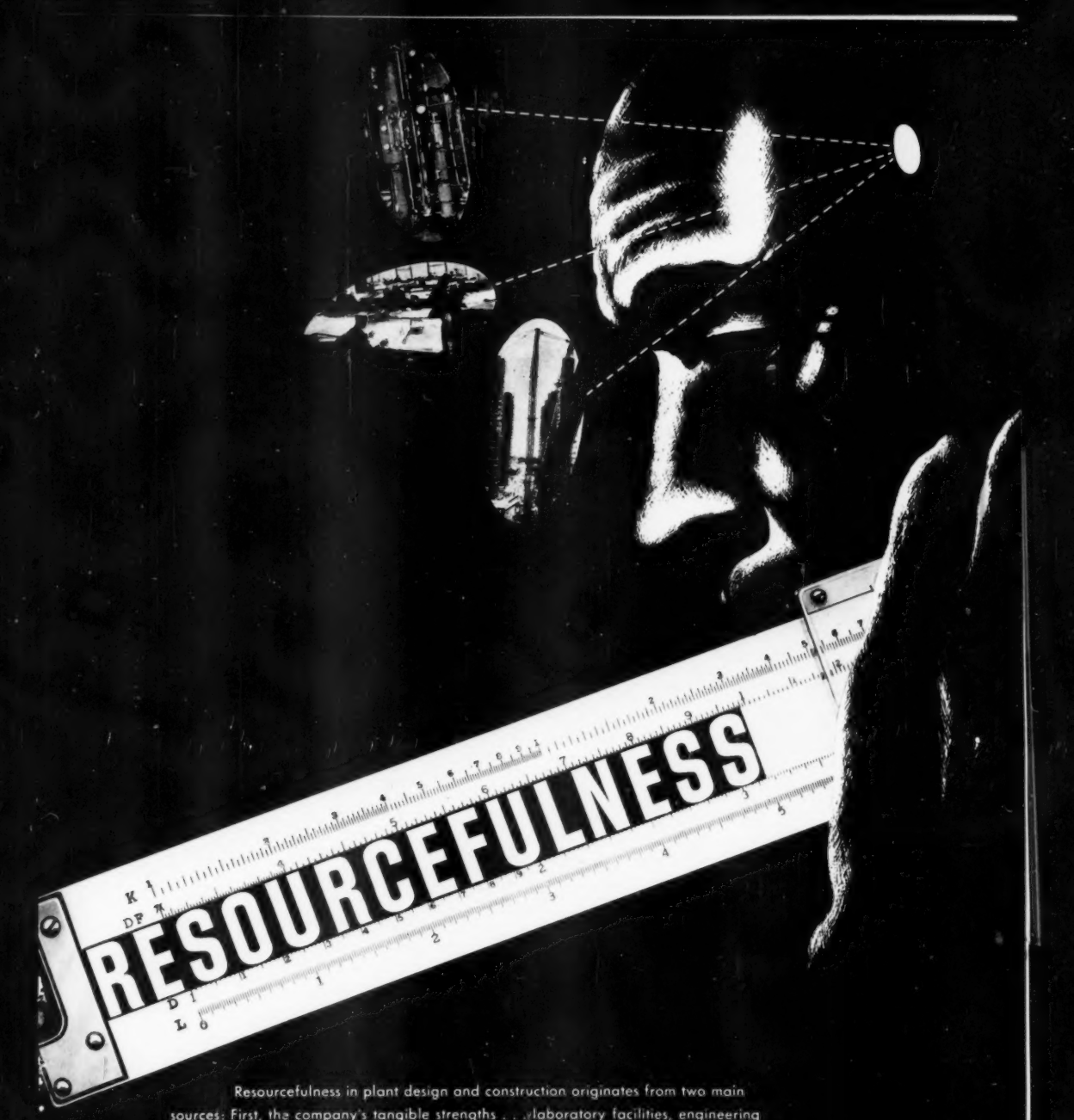
An Invitation To Truck Buyers

We invite you to watch FWDs pass a series of rigid performance tests. Ask your FWD distributor to arrange your visit to our plant. Or — if you can't get away, ask him to show you the movie, *The FWD Story*. In either case, you will see for yourself how FWD trucks can help solve your heavy-duty trucking problems.

Walter A. Allen
President
The Four Wheel Drive Auto Company

THE FOUR WHEEL DRIVE AUTO COMPANY
Clintonville, Wis. • *Canadian Factory:* Kitchener, Ontario
FOUR AND SIX WHEEL DRIVE TRUCKS

America's Foremost Heavy-Duty Truck



Resourcefulness in plant design and construction originates from two main sources: First, the company's tangible strengths . . . laboratory facilities, engineering organization, manufacturing and construction equipment. Second, the capabilities of the *people* within the company organization in facing problems that require ingenuity and innovation.

These two company resources working together give maximum performance, for the resourceful man can accomplish no more than his tools and techniques permit.

Lummus offers you the resourcefulness that comes from complete facilities at the disposal of minds with originality and broad experience.

Economy
Fulfillment
Perspective
Teamwork
Technique

LUMMUS designs and builds with **RESOURCEFULNESS**

RESOURCEFULNESS in construction

Completion of this essential wartime plant faced a seemingly "unavoidable" delay:—the nation's entire shop capacity for tower and tank construction was already fully booked for equally essential work. Lummus met the emergency by building a complete pressure vessel shop on the site. Here, using modern time-saving methods such as automatic welding, towers and tanks for this and other vital war plants were fabricated on schedule.

RESOURCEFULNESS in planning

The problem here was to boost the capacity of a 10,000 B/D topping unit to 25,000 B/D without a serious break in output. By ingenious advance planning, the change-over was made with *only 72 hours downtime*. Nor was it just a "lucky accident"—for Lummus had assumed responsibility in its contract for this 72-hour time limit.

RESOURCEFULNESS in training

To erect this refinery in an isolated foreign location, local native labor was the only practical labor supply. Yet most of these people had never held a tool or even seen a welding torch. Lummus sent supervisors and foremen picked for their training aptitudes, backed them up with modern visual-education methods, organized a training school. "Graduates" were ready to meet erection schedules. Quality of workmanship met every test.

THE LUMMUS COMPANY
420 Lexington Avenue, New York 17, N. Y.

LUMMUS

CHICAGO—600 South Michigan Avenue, Chicago 5, Ill.
HOUSTON—Mellie Esperson Bldg., Houston 2, Texas
The Lummus Company, Ltd., 525 Oxford St., London, W-1, England

Société Française des Techniques Lummus
39 Rue Cambon, Paris 1er, France

Compañía Anónima Venezolana Lummus—Edificio "Las Gradillas"
Esquina Las Gradillas, Caracas, Venezuela

AXELSON FIRST CHOICE

OILFIELD PRODUCTION EXECUTIVES AGREE AXELSON Sucker Rods and Couplings set the quality and dependability standards for the entire industry. AXELSON'S specialization in sucker rod manufacture with a complete factory devoted solely to their production, assures consistently high quality and reliability.

HALF-A-CENTURY OF PROVED PERFORMANCE is behind AXELSON sucker rods and couplings . . . continuous service through the years in every domestic and foreign field . . . unquestioned dependability under all pumping conditions.

LESS DOWN-TIME PRODUCTION LOSSES from rod string failures . . . Finer steels of special alloys . . . advanced design . . . precision machining . . . skillful heat-treating and normalizing, combined, help maintain more profitable production.

WAREHOUSE STOCKS CLOSE TO MOST LEASES mean prompt delivery of rush orders . . . minimum down-time waiting for rods . . . lower production losses . . . greater rod crew efficiency.

FEWER EXPENSIVE PULLING AND FISHING JOBS when AXELSON rods link the prime mover to the pump . . . rods and couplings are engineered for greater strength . . . resist fatigue and corrosion better . . . make up easier . . . last longer in all wells.

AXELSON FIRST CHOICE *in Deep Well Plunger Pumps, Pump Components, Sucker Rods and Hydraulic Long Stroke Pumping Units*

AXELSON *Sucker Rods*

THERE IS NO ECONOMICAL SUBSTITUTE FOR QUALITY

PROVED DEPENDABILITY FOR OVER HALF A CENTURY

AXELSON MANUFACTURING CO. • **PLANTS**—Los Angeles 11; St. Louis 16 • **OFFICES**—New York City 7; Tulsa 1; Buenos Aires, Argentina; Caracas, Venezuela • **DISTRIBUTORS**—Jones & Laughlin Supply Co.; Great Northern Tool & Supply Co.; Industrial Agencies, Ltd., San Fernando, Trinidad, B.W.I.; Industrias Waldrip & Campbell, Barcelona and Maracaibo, Venezuela.

The *NEW* BOFEC CASING HEAD

showing many Advanced Features

Automatic locking and releasing boll weevil operated by making up or breaking out tubing landing joint.

Arch packer assemblies closing on casings operated independently of casing slip load.

Casing slips heat treated and specially hardened on wickers.

Cross-over flanges with pack-off can be supplied.

All manufactured in accordance with A.P.I. Standards.

Side outlets flanged or direct screwed as required.

Illustration (left) shows casing slips, boll weevil, arch packer and packing pressure plate stripped from casing head.

BOFEC

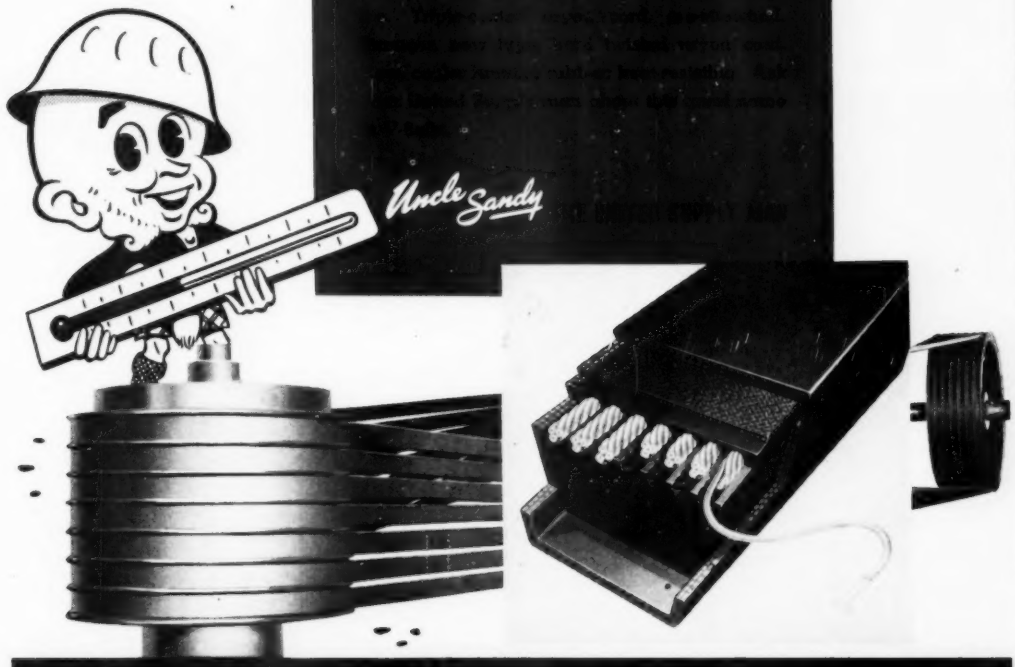
REGD. TRADE MARK

The Largest "ALL BRITISH" Company Manufacturing Exclusively Oilfield Equipment

BRITISH OILFIELD EQUIPMENT CO., LTD., BOFEC WORKS, HUNSLET LEEDS, 10, ENGLAND. TEL.: LEEDS 30035, 6, 7, 8. · LONDON OFFICE: DUKE'S COURT 32 DUKE STREET, ST. JAMES'S, S.W.1. TEL.: WHitehall 6177.

great names

B. F. Goodrich

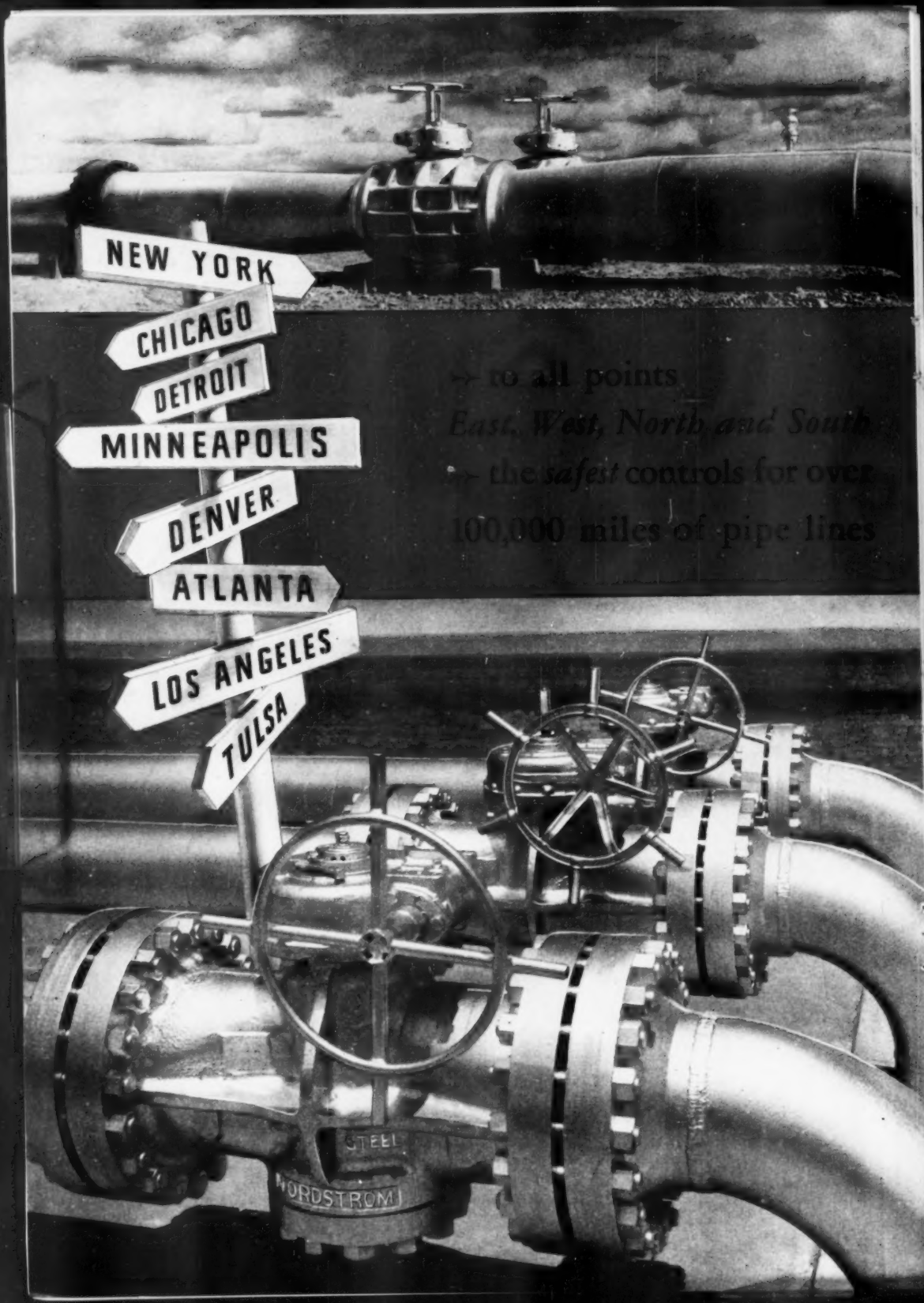


Courtesy
Service
Dependability

AND *Manufacturing* COMPANY

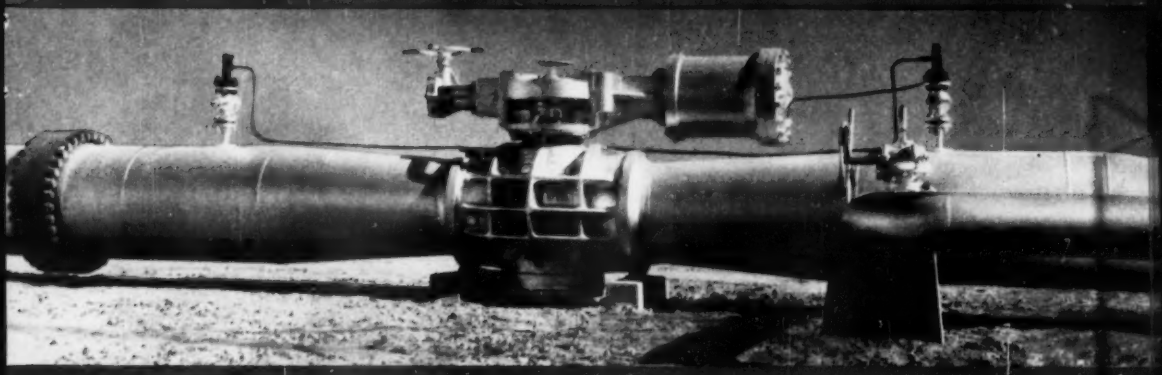
TULSA, OKLAHOMA

Stores in Kansas, Oklahoma, Texas,
Louisiana, and New Mexico


NEW YORK
CHICAGO
DETROIT
MINNEAPOLIS
DENVER
ATLANTA
LOS ANGELES
TULSA
→ to all points
East, West, North and South
→ the safest controls for over
100,000 miles of pipe lines
STEEL
HORDSTROM

WHERE PIPE LINE DEMANDS ARE EXTREMELY EXACTING

Nordstrom valves are the unquestioned choice



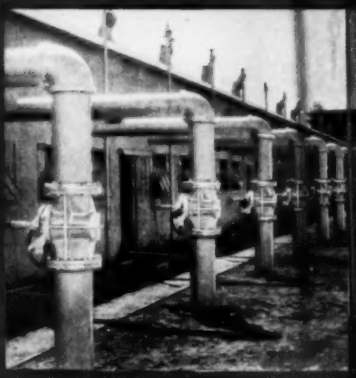
The biggest lines, the longest lines, the highest pressure lines—most of them are Nordstrom-equipped—and this applies to crude oil, gas and product lines. Many of these valves have been in service for 20 years and longer, proof of their reliability and endurance.

Nordstrom Hypressed valves provide a combination of all the factors necessary for 100% safety, positive shut-off, practically unlimited life, easy operation, permanent adjustment, economy of lubrication and the ability to be repacked under pressure (in any position).

By use of standard, factory-built extensions, Nordstroms can be buried, saving the cost of vaults. In addition to manual operation, remote controls can be furnished—cylinder or electric motor operation, automatic shut-off, etc. Pipe line valves are available in a complete range of pressures, types and sizes up to 30/36-inch.

When you plot and plan your pipe lines, to obtain the maximum advantages, make Nordstroms a component part of the project.

KEEP UPKEEP DOWN. Use only genuine Nordstrom lubricants.



Nordstrom LUBRICATED VALVES

NORDSTROM VALVE DIVISION — Rockwell Manufacturing Co.
400 N. Lexington Ave., Pittsburgh 8, Pa.

Atlanta, Boston, Chicago, Houston, Kansas City, Los Angeles, New York, Pittsburgh, San Francisco, Seattle, Tulsa
and leading Supply Houses. Export: Rockwell International Corp., 270 Lafayette Street, New York 12, N. Y.

How can you judge a refinery's performance *before it's built?*

NO INDUSTRY depends to a greater degree on the efficiency of its physical plant than the petroleum processing industry.

Your best indication of the performance of your projected plant lies in the past record and experience of the organization which will design and build it.

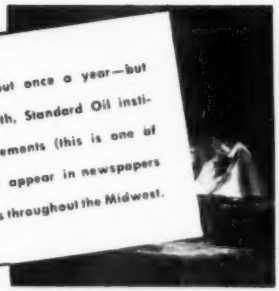
McKee's long record of engineering successful processing facilities in all quarters of the globe is safe assurance of the reliable performance to be expected from McKee-engineered plants.

ARTHUR G. McKEE & COMPANY

DESIGN, ENGINEERING AND CONSTRUCTION FOR THE PETROLEUM REFINING AND IRON AND STEEL INDUSTRIES

ENGINEERS AND CONTRACTORS • ESTABLISHED 1905
2300 CHESTER AVENUE, CLEVELAND
30 Rockefeller Plaza, New York, N. Y.

Birthdays come but once a year—but month after month, Standard Oil institutional advertisements (this is one of the 1949 series) appear in newspapers and farm papers throughout the Midwest.



MAYBE YOUR GRANDMOTHER was one of the ladies we met back in the oil lamp days, when we were starting in business. In the Nineties kerosene was our principal product. Gasoline was pretty much a useless by-product that we had a hard time getting rid of.

THE STANDARD OIL wagon was a familiar sight around the turn of the century. It was especially welcomed by our customers after we licked the "skunk oil" problem with a new refining method that took the sulfur smell out of certain types of kerosene.

WHEN THIS CAR was brand new, in 1912, gasoline was becoming important—but the Burton process, with which Standard pioneered high quality, low cost gasoline in the quantities demanded by the automobile age, was not yet in operation.

HERE'S DAN MITCHELL and his wife. We first met Dan when he went to work for us in 1923. Last year he retired, and now receives a monthly check for life under Standard's employee retirement plan. We began retirement payments in 1903, were one of the first to do so.

WE MET MARIANNE LEWIS only five months ago, when her father received a check that covered a good part of the expense of her birth. Mr. Lewis works for us, you see, and participates in one of the finest, broadest employee benefit programs in any industry.

HERE'S THE MAN who grows food for your table, driving the tractor that makes it possible for him to feed you better than any nation has ever been fed before. 3,115,000 tractors are now working on American farms—and every one of them needs fuel and lubricants.

SOME PEOPLE WE'VE KNOWN IN OUR FIRST 60 YEARS

IT'S THE SAME with us as it is with you: the people we know and work with are the people who make us what we are. As Standard Oil celebrates its sixtieth birthday this week, we are thinking with affection and gratitude of the people we've known.

Among them are all the employees of this company and its subsidiary companies—drillers, transportation workers, refiners and marketers. They now number 48,000 men and women—an integrated team, working together efficiently to bring you quality petroleum products at economical prices.

We're thinking, too, of the 97,000 present owners of Standard Oil, and the many thousands of independent service station operators who now handle our products.

And we're thinking of our millions of customers. Their demand—your demand—for petroleum products has grown with the years and kept us growing in order to meet it.

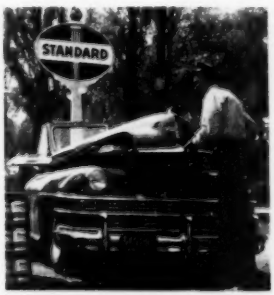
To all these people—to you—we say, "Thanks for the memories of our first sixty years."

• • •

STANDARD OIL COMPANY (INDIANA)

THIS DIESEL LOCOMOTIVE is one of many that have vastly improved the service offered you by America's railroads—and helped cause a 198% jump in Diesel Oil consumption since 1941. In the same period, home heating fuel oil consumption has risen 76%.

WE HELPED MEET THE SERVICES' needs in two wars, now supply petroleum products for defense. In war, military *and* essential civilian demand must be met, so the more than $630,000,000 we have spent since 1945 for new facilities is also an investment in national security.

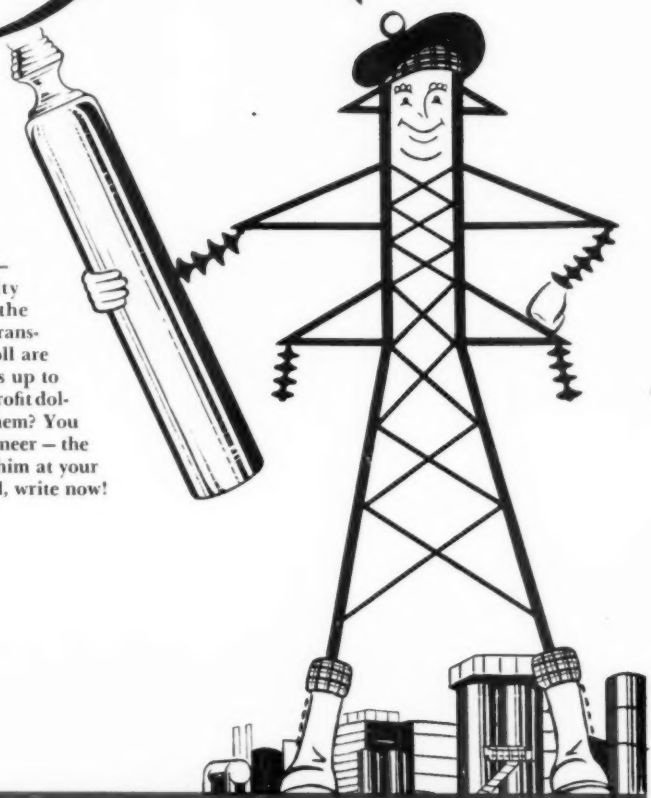


WHEN YOU DRIVE in to one of the many thousands of stations at which independent business men sell our products, you're a welcome friend. We hope you will drive in often, and if we succeed in satisfying you we will celebrate many happy birthdays in the years to come.

LOW COST POWER

Look before you spend— the dollar you save may be your own!

LOW COST POWER'S career in the oil industry is an open book! In the bulky Utility Electric Power files are case after case showing that after close and unbiased analysis of the comparable factors, the decision could only be ONE way — **ELECTRIC POWER** through Utility Electric facilities! To begin with, the equipment cost is less. It's easier to transport! Maintenance expense and payroll are materially reduced! All of which adds up to more profit on the operation. These profit dollars belong to you—are you getting them? You can find out from your Power Engineer — the man who **CAN TELL YOU!** Ask for him at your nearest Utility Electric Company. Call, write now!



Use Utility Electric Power!

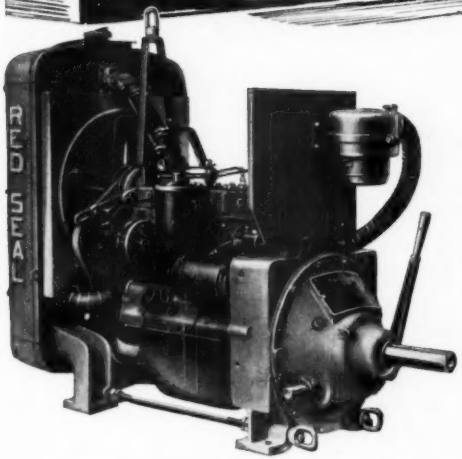
PETROLEUM ELECTRIC POWER ASSOCIATION

Box 1498, Oklahoma City, Oklahoma

RED SEAL ENGINES

CONTINENTAL MOTORS · Powering the Nation · AMERICA'S STANDARD

BUILT FOR THE JOB!



Cut Costs-Speed Work

with dependable Red Seal POWER

More and more operators are finding out about the low maintenance cost and high availability factor of Continental Red Seals — the engines designed to operate for longer periods without interruption. Red Seals reduce both direct and secondary costs, because they're on the job every time — and all the time — you need them. It will pay you to power your equipment with these high-performance, high-dependability engines. There are models to meet a wide range of oil field power needs.

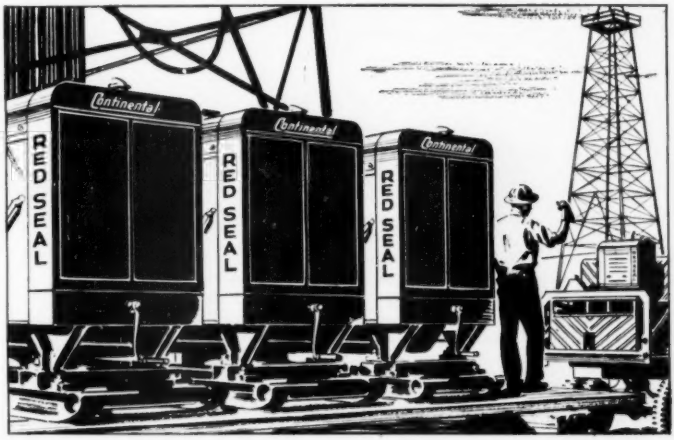
F-162 OPEN POWER UNIT. This model has all the features that keep Red Seal engines on the job more hours per year. Perfected cooling; Roto valves; individual porting; removable tappets, plus unusual ease of adjustment and servicing. Write for Bulletin PF 47162.*

Continental Motors Corporation
205 MARKET ST., MUSKEGON, MICHIGAN
P.O. BOX 2309, DALLAS, TEXAS

RED SEAL ENGINES

MEET EVERY POWER NEED

Big new Red Seal oil field engines have recently been added to the line, so that there is an engine with the correct power output for practically every oil field job. Free bulletins on these engines are available. Write for them, indicating the type of application, or the horsepower range in which you are interested.



Common troubles licked here!

HERE is a Darling Gate Valve designed to relieve you of the most common valve troubles. There are a number of contributing features, but let's take only two . . .

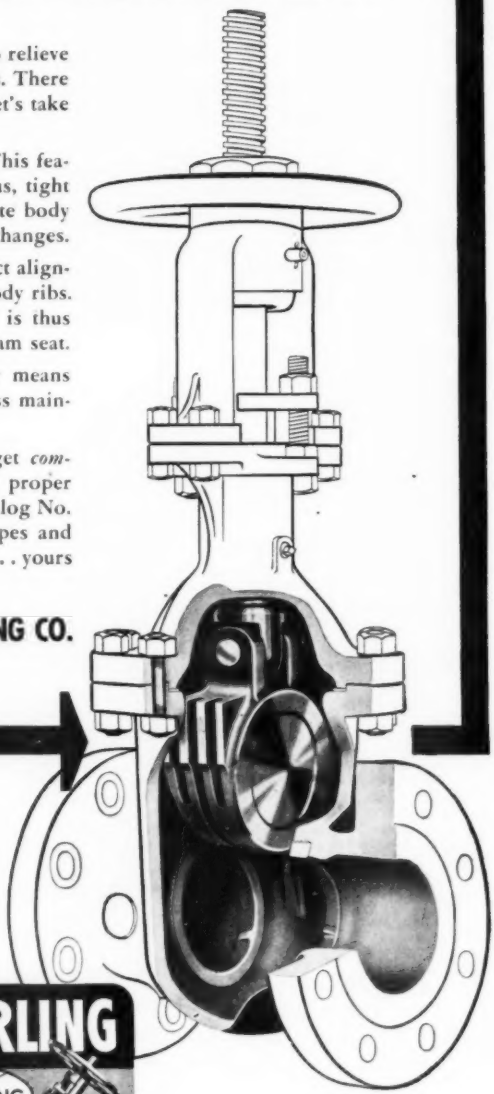
First, note the center slot in the wedge. This feature allows compression of the wedge. Thus, tight closing and easy opening are assured despite body expansion or contraction due to temperature changes.

Secondly, wedge travel is guided for perfect alignment by *double* wedge grooves and *twin* body ribs. Canting of wedge caused by line pressure is thus eliminated, preventing damage to downstream seat.

Here's a combination that just naturally means more reliable operation . . . less trouble, less maintenance, less cost!

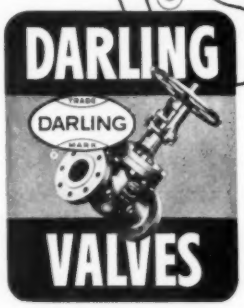
Outline your service requirements and get *complete* information on Darling Valves of the proper type. Or, send for the 300-page Darling Catalog No. 17M. It describes Darling Valves of all types and sizes . . . and is full of data of general value . . . yours for the asking.

DARLING VALVE & MANUFACTURING CO.
WILLIAMSPORT 1, PA.



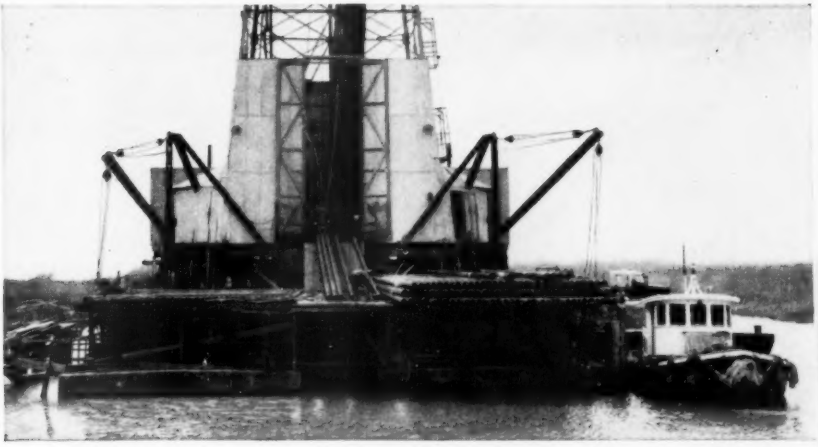
Darling
Slotted Wedge
Cast steel gate valves

Darling Gate Valves, noted for outstanding quality, strength and precision, are made in a wide range of sizes, types and constructions for all kinds of normal and unusual service . . . and for pressures up to 1500 pounds. In addition to the *Slotted* wedge types, there are solid wedge taper seat valves and the famous Darling Fully Revolving Double Disc Parallel Seat Gate Valves for virtually any service.



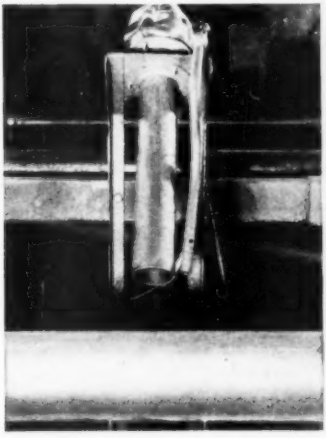
THE VALVE MARK OF QUALITY... WATCH FOR IT

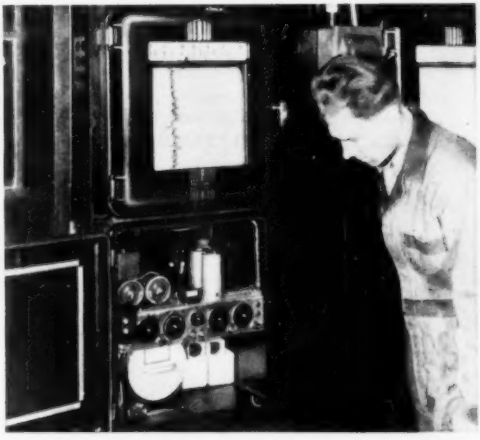
DEPENDABILITY THROUGH



IN A SOUTHERN FIELD: A 10,000-foot string of 7-inch S-80 and S-105 SMITHway Casing being run in the bayous of Louisiana.

RESEARCH AND ENGINEERING





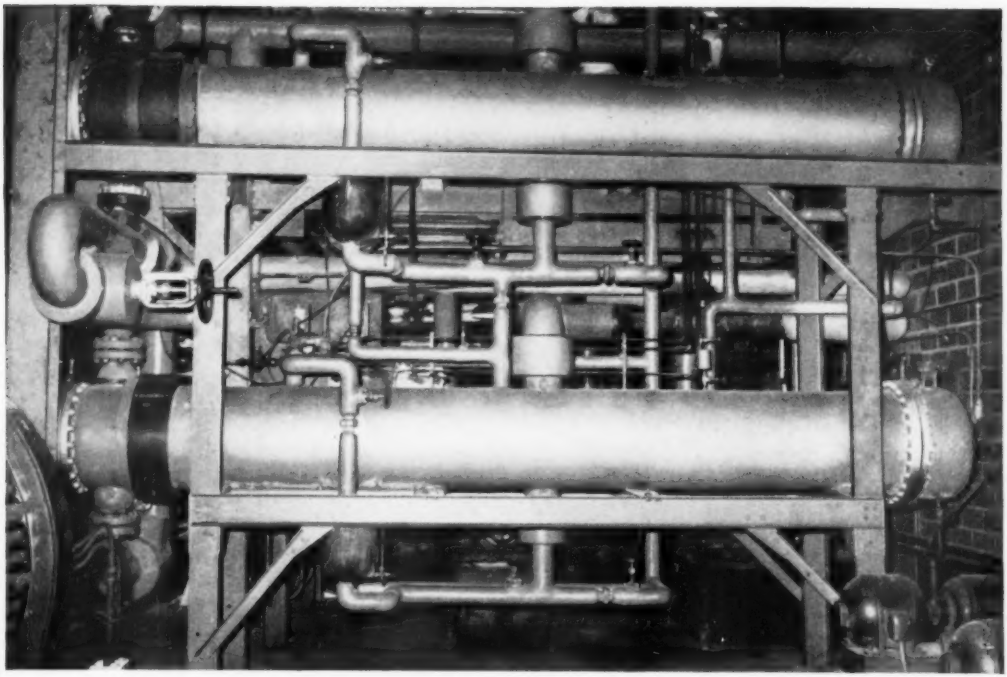
IN THE A. O. SMITH PIPE MILL: This equipment is used for measuring and controlling Casing temperature for certain manufacturing processes.

A.O. SMITH CORP. 75th ANNIVERSARY 1874 1949

SMITH*way* CASING · LINE PIPE

A. O. SMITH CORPORATION

New York 17 • Pittsburgh 19 • Atlanta 3 • Chicago 4 • Tulsa 3 • Dallas 1
Houston 2 • Seattle 1 • Los Angeles 14 • International Division: Milwaukee 1



K&M "Featherweight" 85% Magnesia Insulation is used on piping and heat exchangers in this compressor room.

Heat...and cold cash...conserved by

K&M *"Featherweight"* 85% MAGNESIA

Basic Carbonate of Magnesia is combined with Asbestos Fibre in K&M "Featherweight" insulation. Its use on steam pipes and throughout heat exchanger systems is supplying particularly good proof of a whole series of economies that users enjoy...

(1) The highly effective insulation *piles up fuel savings.*

(2) Extreme lightness and easy application *cut installation costs.*

(3) Lasting strength and efficiency mean *freedom from maintenance.*

All this is being demonstrated all the time, in process plants, power plants and on other industrial applications where the heat-saving responsibility belongs to K&M "Featherweight".

You can get K&M "Featherweight" 85% Magnesia in all standard sizes. It is designed for temperatures up to 600° F.

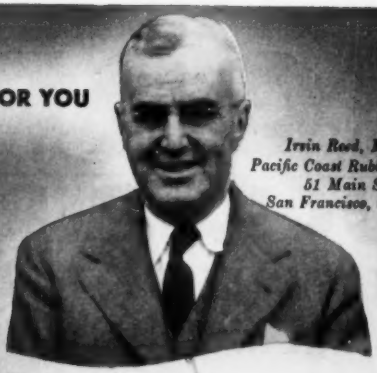
There are K&M Distributors at strategic points throughout the country. They are experts on the application of this and all the other K&M insulation materials. One of them near you can help to make insulation more useful and profitable to you. Or write us.

K&M Best in asbestos

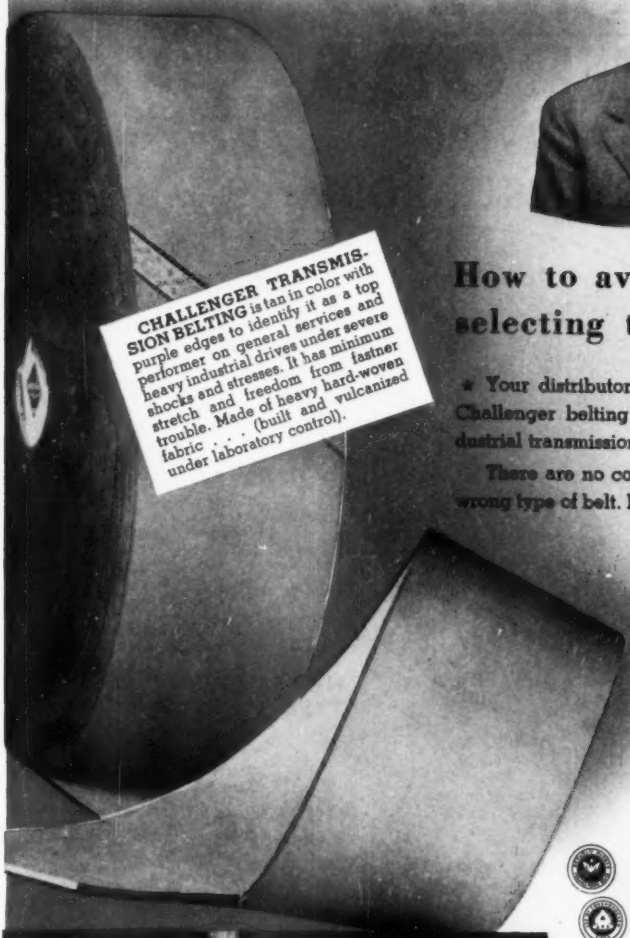
Nature made Asbestos...
Keasbey & Mattison has made it serve mankind since 1873

KEASBEY & MATTISON
COMPANY • AMBLER • PENNSYLVANIA

HERE'S WHAT REPUBLIC DISTRIBUTORS DO FOR YOU



Irvin Reed, Manager
Pacific Coast Rubber Company
51 Main Street
San Francisco, California

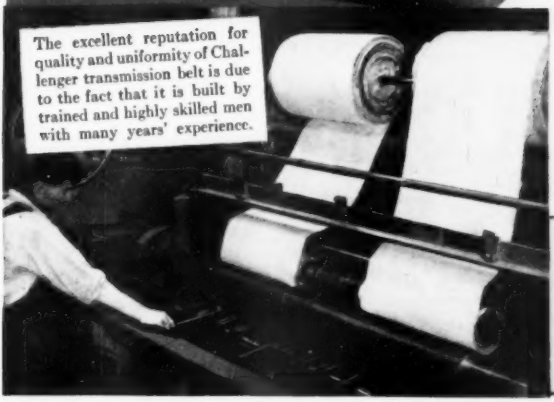


CHALLENGER TRANSMISSION BELTING is tan in color with purple edges to identify it as a top performer on general services and heavy industrial drives under severe shocks and stresses. It has minimum stretch and freedom from fastner trouble. Made of heavy hard-woven fabric . . . (built and vulcanized under laboratory control).

How to avoid high cost when selecting transmission belting

★ Your distributor of industrial supplies will tell you that Challenger belting is breaking records on all types of industrial transmission drives.

There are no costly shut-downs due to application of the wrong type of belt. Experienced distributors such as Mr. Irvin Reed (pictured above) can help you choose the grade and type belting which will serve you best. And, there is a national network of Republic distributors to serve industry everywhere. If you feel you should be getting longer life from your belting, consult your telephone directory for the name of your Republic distributor, write or mail the coupon.



The excellent reputation for quality and uniformity of Challenger transmission belt is due to the fact that it is built by trained and highly skilled men with many years' experience.

REPUBLIC RUBBER DIVISION
Lee Rubber & Tire Corporation, Youngstown, Ohio
Lee Deluxe Tires & Tubes — Conshohocken, Pa.

MECHANICAL RUBBER GOODS BY
REPUBLIC RUBBER DIVISION

WHO REPRESENTS REPUBLIC IN MY AREA?
REPUBLIC RUBBER DIVISION · LEE RUBBER & TIRE CORP.
YOUNGSTOWN, OHIO

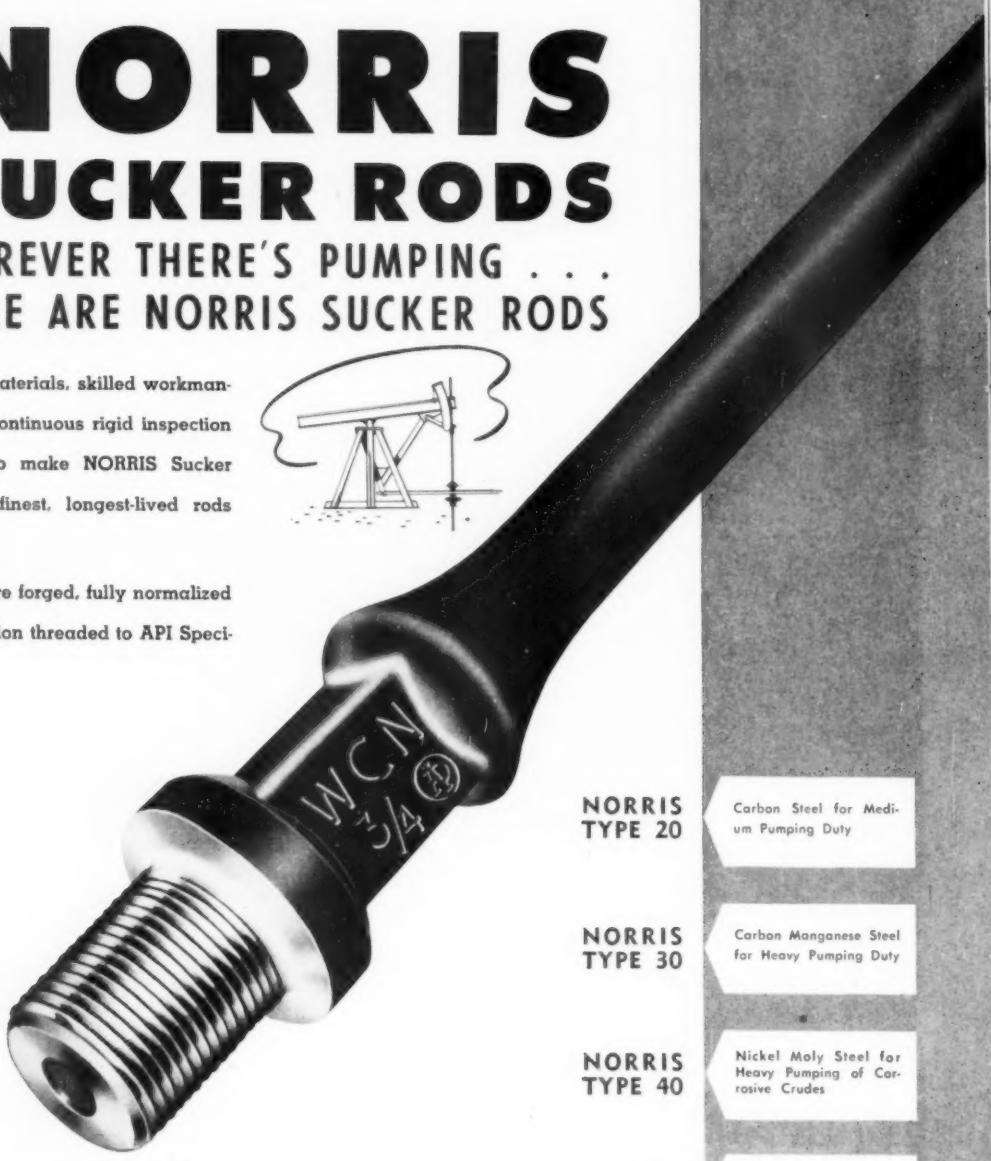
Name, title_____
Firm_____
Address_____
City_____ State_____

NORRIS
SUCKER RODS

WHEREVER THERE'S PUMPING . . . THERE ARE NORRIS SUCKER RODS

Selected materials, skilled workmanship and continuous rigid inspection combine to make NORRIS Sucker Rods the finest, longest-lived rods available.

All Rods are forged, fully normalized and precision threaded to API Specifications.



NORRIS TYPE 20 — Carbon Steel for Medium Pumping Duty

NORRIS TYPE 30 — Carbon Manganese Steel for Heavy Pumping Duty

NORRIS TYPE 40 — Nickel Moly Steel for Heavy Pumping of Corrosive Crudes

NORRIS TYPE 50 — High Nickel Moly for Heavy Pumping of High Corrosive Crudes

For Complete Information Write for Bulletin No. 28-B

W.C. NORRIS, MANUFACTURER, INC.

TULSA, OKLAHOMA

BRANCHES:
HOUSTON, KILGORE, ODESSA, TEXAS;
SALEM, ILLINOIS; CASPER, WYOMING

EXPORT: 30 ROCKEFELLER PLAZA, NEW YORK CITY

Since QUALITY PRODUCTS 1882

WEST COAST DISTRIBUTORS:
HICKEY PIPE & SUPPLY CO.
Los Angeles

Published every Thursday by The Petroleum Publishing Co., 211 S. Cheyenne, Tulsa, Okla.

P. C. LAUINGER
President

S. H. ROURKE
Business Manager

HANSON B. PIGMAN
Circulation Manager

ADVERTISING
MITCHELL TUCKER
Manager

Houston Office
Sterling Building, Phone Charter 4-4626
WAYNE RIVES
Vice President, Gulf Coast Sales
JOHN M. SPEARS
Representative

New York Office
415 Lexington Ave., Phone Murray Hill 2-4731
CHARLES A. WARDLEY
Eastern Manager
ROBERT N. CAIRD, JR.
Representative

Chicago Office
105 West Madison, Phone Central 6-2537
C. R. FARMER
Manager
E. S. KLAPPENBACH
Representative

Pittsburgh Office
429 Fourth Ave., Phone Atlantic 4835
ALFRED M. JONES
Representative

Tulsa Office
211 S. Cheyenne, Phone 3-6291
JOHN D. REILLY
Mid-Continent Manager
J. PARKER HOLLAND
Production Manager

Los Angeles Office
650 S. Grand Ave., Phone Vandike 0722
DONALD O. HANSON
Manager

England Office
111 Thorley Lane, Timperley, Cheshire
HARRY S. BECKER
European Representative

Member
Audit Bureau of Circulations
Associated Business Papers

JOURNALLY Speaking

'Gator Gag

THE employe magazine of Barnsdall Oil Co. printed these two pictures with the following comment:

"Which Twin is the Phony?

"Somebody, somewhere, pulled a fast one. We won't say who, for probably we are as responsible as anyone. But here are some interesting facts: the picture at the right appeared in an issue of The Oil and Gas Journal last summer; and the one at the left appeared in Barnsdall Life in December, having been submitted by the drilling department. Look them over and draw your own conclusions."

Our own picture, we can testify, was received direct and unretouched from Stanolind Oil & Gas Co. which said the 12½-ft. alligator was shot by Rene Gaspard on the company's White Lake, La., lease.

The Barnsdall picture was printed with a cutline saying that V. V. Thomasson, the company's assistant general drilling superintendent, while night fishing in Cypress Lake in Louisiana, tied a trot line to what he thought was a log and hauled out this 15-ft. 'gator.

A careful investigation, utilizing the most modern FBI methods, leads to the inevitable conclusion that someone, the victim doesn't yet know who, pasted Thomasson's head on our picture of Gaspard's body and palmed the spurious document off on Barnsdall's unsuspecting editor.

Just goes to show you never can trust an oil man.

No Offense

CONTINENTAL OIL CO. has hit a new high in optimism. It is asking its motoring employes to sign a pledge to "make allowance for the other fellow's carelessness, lack of skill, and knowledge."

That's asking too much of an ordinary mortal. Where's the thrill of driving if you aren't going to gamble on what the other guy will do?

Employes who take the pledge get a bronze pin denoting membership in the "Defensive Drivers' Club." The announcement doesn't say so, but membership in the club should also include the privilege of being late to work, and Continental ought to organize trolley rides and back-yard picnics for club members. At least in our parts the only way to avoid the other fellow's carelessness is to stay off the road, because too many drivers seem to believe that the best defense is a vigorous offense, and some of them are very offensive indeed.

—Henry D. Ralph

Ready to Serve YOU
Whether BUYING or SELLING
Butane, Propane, Natural Gasoline
and Other Petroleum Products
Anchor is your dependable, long-range source of supply for high quality petroleum products. Efficient, regular delivery — nation-wide and export.
If you wish to SELL, take your marketing problems to Anchor. Complete transportation facilities and terminals for coast-wise or export shipments.
Anchor is progressive, with experienced, friendly folks ready to serve you.
To BUY or to SELL, call Anchor First.
call anchor first . . .
ANCHOR PETROLEUM COMPANY
Atlas Life Bldg. Tulsa, Oklahoma
ANCHOR
ANCHOR

The OIL AND GAS JOURNAL

FOUNDED IN 1910 BY PATRICK C. BOYLE

VOL. 48, NO. 5 JUNE 9, 1949

EDITORIAL STAFF

C. O. WILLSON
Editor

Kenneth B. Barnes — Engineering Editor
Henry D. Ralph — News Editor
George H. Weber — Refining Editor
415 Lexington Avenue, New York City
Paul Reed — Pipe Line Editor
W. L. Nelson — Technical Editor
Lynn M. Nichols — Associate Editor
Neil Williams — Associate Editor
Charles J. Deegan — Associate Editor
R. B. Tuttle — Associate Editor
C. Dudley Johnston — Staff Artist

DISTRICT EDITORS

Dahl M. Duff — 415 Lexington, New York City
Ted A. Armstrong — 211 S. Cheyenne, Tulsa
Roy F. Carlson — 211 S. Cheyenne, Tulsa
John C. Casper — 211 S. Cheyenne, Tulsa
Robert Harwick — 650 S. Grand, Los Angeles
Carl F. Hoot — Mercantile Bank Bldg., Dallas
Victor Lauriston — 35 Stanley Ave., Chatham, Ont.
Bertram F. Linz — 621 Albee Bldg., Washington
Leigh S. McCaslin — Sterling Bldg., Houston
John C. Reidel — 211 S. Cheyenne, Tulsa
William P. Sterne — 211 S. Cheyenne, Tulsa
D. H. Stormont — Mercantile Bank Bldg., Dallas
Polly DeArmond — Editorial Assistant, Tulsa

CORRESPONDENTS AT

Denver, Colo. — Calgary, Alta.
Pittsburgh, Pa. — Ashland, Ky.
Columbus, Ohio — Oil City, Pa.
Mount Pleasant, Mich.

Subscription rate to the petroleum industry, United States and foreign, 1 year, $3.00. Single copies, 50 cents. Back copies when over a year old, one dollar. Note: Payments from outside the U.S.A. may be in the form of an international money order or check on a U.S.A. bank. Entered as second-class mail matter at Tulsa, Okla., under Act of March 3, 1879. Copyright 1949 by The Petroleum Publishing Co.

In This Issue

News

Tentative Compromise on Tidelands Drafted; Adoption Doubtful 56
Gas Transmission Lines Increasing in Efficiency, A. & I. Told 57
New California Gravity Scale May Set Crude-Price Pattern 58
Growth in Taxes and Regulation Worry Rocky Mountain Oil Men 60
Gulf Men Study Production Problems 61
Refinery Workers Third Highest Paid in Country, Survey Shows 62
Senate Passes Bill to Relieve Basing-Point Price Confusion 63
FPC Members Now Approve Exempting Some Gas Producers 139
International Bank Will Make Survey of Colombia's Economy 141
Germans Make Discovery Close to Dutch Border 141
Brantly Keeps Tab on World-Wide Operations 142
Exploration Remains Active in Venezuela; Fewer Rigs Running 143
Argentina Shuts Out U. S. Oil With British Trade Agreement 144
Pemex Makes High-Gravity Discovery in Isthmus Area 144
Sinclair Surrenders Panama Concession 145
Big Increase in Oil Imports by Marshall Plan Countries Seen 147
Hallanan Says Industry Must Keep Promise to Cut Imports 148
Petroleum Equipment Suppliers Elect Guy Tompson President 150

Engineering-Operating

In-Fill Drilling 68
Primary Long-Chain Alcohols, a New Petrochemical 71
Detection of Incipient Drill-Pipe Failures 79
Performance of Primary Pressure Control 86
Questions on Technology 92
Advances in Pipe-Line Pumping Equipment 93
13-Day Turnaround at Sinclair's Marcus Hook Fluid Unit 94
Engineering Fundamentals—Phase Concepts 99
Cost-imating—Instrumentation 101

Exploration-Development

100 Million Acres in Canadian Land Play 119
Highlights of Week's Developments 119
Reports by Areas Start on Page 120

Departments

Journally Speaking 51
Editorial 55
This Week 59
Personals 64
Deaths in the Industry 66
Refining News 108
Natural-Gas News 110
Pipe-Line News 112
Drilling Contractors 116
Running High 117
International News 141
Watching Washington 152
Equipment Men in the News 155
Exploration Statistics 158
Production Statistics 159
Refining Statistics 160
Market Statistics 161
Classified Advertising 162
Calendar of Events 166
Advertisers' Index 166

Protect THOSE LOW-PRESSURE ZONES FROM CEMENT CONTAMINATION

The difficult problem of cementing a string of casing at a predetermined point above the bottom of the hole, while protecting a permeable, low-pressure zone below from cement contamination is successfully being solved by using Baker Triplex Cementing Equipment.

The features of design and construction which insure its successful performance are "tried and true" Baker principles. Baker Metal Petal Baskets have been used universally for years in many types of cementing; and the Baker "Whirler" principle long has been proved superior to jetting action, which may not only fail to prevent channeling, but may wash out cavities with resultant contamination of the cement slurry.

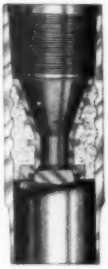
With the Baker Triplex Cementing Shoe (Product No. 136) all cement slurry is directed upward through side whirler ports of the shoe, and a back-pressure valve prevents any return flow of the slurry. The Baker Metal Petal Basket forms a bridge even in large diameter holes; readily conforms to hole irregularities over a wide range of diameters; and prevents the cement slurry from settling in permeable, low-pressure zones below. A Baker Model "G" Casing Centralizer, positioned just above the Triplex Shoe, assists in perfect cementing performance.

ACCESSORY EQUIPMENT OPTIONAL

When it is desired to retain cement tailings inside the casing (thus preventing dilution of the cement slurry around and above the Triplex Shoe) either of two collars may be used, *as illustrated below:*

Baker Triplex Cement Baffle Collar (Product No. 137) is used when a stop for the cementing plug is desired, to retain cement tailings inside the casing.

Baker Triplex Flapper Valve Float Collar (Product No. 134 M&F) provides the safety of an additional float valve, as well as a stop for the cementing plug.



Baker Triplex Cementing Shoe, Product No. 136. Named "Triplex" because it performs a "triple" service: (1) is an efficient float shoe for running-in the casing; (2) whirls the cement slurry upward to minimize danger of channeling; (3) Metal Petal Basket expands to form a bridge which prevents cement contamination of low-pressure zones below.

HERE'S HOW *Triplex* BRINGS YOU "BAKERESULTS"

(A) Baker Triplex Cement Baffle Collar, installed a joint or two above the shoe, serves as a stop for the cementing plug. (B) A hold-down strap retains Baker Metal Petal Basket against the "TRIPLEX" Shoe while running-in. (C) Cementing Ports are covered by Tripping Valve until cementing is commenced. (E) After reaching the desired point in the hole, circulation is established through central passageway. A Tripping Ball is pumped down the hole to seat upon the Tripping Valve. Pressure is applied to shear the Tripping Valve shear screws and force the Tripping Valve downward to expose the cementing ports. (F) Shearing these screws also releases the Basket hold-down strap and allows the Metal Petal Basket to expand against the walls of the hole. (D) A resilient rubber, sleeve-type, back-pressure valve opens readily (see dotted white line) to permit passage of slurry into annulus above. Cementing then is carried out in conventional manner with cement slurry directed upward by the exclusive Baker "Whirling" action. Only readily drillable materials are used for all internal parts.—Look in your BAKER (or Composite) CATALOG, or write to BAKER OIL TOOLS, INC., at Houston, Los Angeles, or New York for complete information.

BAKER OIL TOOLS, INC.

HOUSTON • LOS ANGELES • NEW YORK

BAKER *Triplex* CEMENTING EQUIPMENT

THE OIL AND GAS JOURNAL

Consumption

IT has been said that oil men in their attitude toward their business are either "hot" or "cold." Actually their operations, if accurately appraised, are never as hot nor as cold as many profess to believe, and the successful operator or firm is one that realizes that fact and acts accordingly.

Following a 3-year postwar adjustment period of rapidly expanding demands and strong markets, requirements in recent months have leveled off, prices on several refinery products have weakened, and realizations are lower. As a result, the viewpoints of some regarding the present and future of the oil industry have shifted to cold from the heat of a year ago. They were wrong then and they are now.

The well-being of an industry in the final analysis rests with its customers, and in that regard petroleum has no equal among major enterprises. As shown in the 20-year trend chart on page 59 of this issue, oil and natural gas occupy an exceptionally strong position as to demands.

It will be noted that while the coal, automotive, and steel industries experienced production decreases of 40 to 75 per cent in the early thirties compared to the boom year of 1929, the declines in oil and gas were less than 15 per cent. These two industries quickly resumed their upward demand trends while many others had to wait for the war demands.

This year's domestic oil requirements will be more than twice what they were in 1929 and 64 per cent greater than in 1939. The percentage gains in natural gas have been even more phenomenal, with this year's consumption to be 179 per cent greater than it was 20 years ago and 116 per cent larger than in 1939. Gains of 50 per cent are exceptional in other major industries, with several compelled to go back to 1929 for their peak year.

There are several reasons for this strong demand position of petroleum. Low prices to customers is one. At the close of last year the petroleum wholesale price index was 122 and natural gas 91.1, which compares with 194.9 for bituminous coal and 162.3 for all commodities.

New and old outlets for petroleum and natural gas have expanded rapidly, with further gains assured. Ten years ago there were less than 1,000 diesel locomotives, but the number will be approximately 10,000 by the end of this year. Oil-burner installations have increased from 1,750,000 to more than 4,000,000 in 10 years. Gasoline consumption has grown in several directions. In 1915 coal accounted for 86 per cent of total national energy utilization and oil and gas had 12 per cent. Now both are 46 per cent.

An ending to the abnormal conditions brought about when this industry was called upon to supply enlarged peacetime needs following the war's operating curtailments was both inevitable and desirable. It means a return to the normal yardsticks, and when the oil business has once more become accustomed to their use it should be able to plot its course along sound lines for a prolonged period.

Tentative Compromise on Tidelands Drafted, but Adoption Is Doubtful

by Bertram F. Linz

WASHINGTON.—Three days of conferences between state officials and Speaker of the House Sam Rayburn culminated last week into submission to Atty. Gen. Tom C. Clark and Interior Secretary J. A. Krug of state-devised proposals for a compromise of the tidelands issue.

Just what was involved in the compromise was not disclosed definitely, but it is understood to carry the state's concession of limited paramount rights to the federal Government, full control of development and operations by the states within their claimed territorial waters, and a division of the revenues therefrom, with the Government to get 37½ per cent from the states' waters and the states to get a similar percentage from operations beyond their seaward boundaries.

The draft of the proposals, Rayburn said, runs six or seven pages and while it was not approved unanimously in its entirety the state officials agreed on most points. The speaker expressed the hope that Clark and Krug would make their views known some time this week.

There was no expectation that the original proposal would get an immediate O.K. from the two cabinet members. It represents the states' idea of a proper compromise, but undoubtedly there will be points on which the administration will not agree.

Texas Is Adamant

There also are points still to be settled from the states' side, one of them the insistence by Texas Atty. Gen. Price Daniel that any legislation resulting from the negotiations recognize the annexation treaty by which Texas entered the Union, an agreement which differs from that under which any other state was admitted and on which Texas bases its hope of defeating the Government's suit in the Supreme Court for seizure of its tidelands.

It was also made clear that the suits against Texas and Louisiana will be continued and that if the states win they will not accept any compromise. This apparently would leave California out in the cold, but that state is tagging along with Texas and Louisiana since it has nothing to lose and might stand to benefit by a compromise.

Participating in the conferences were Atty. Gen. Price Daniel, Land Commissioner Bascom Giles, and R. L. Bobbitt, former attorney general representing the state bar, for Texas; Atty. Gen. Bolivar Kemp and Leander H. Perez, political leader, for Louisiana; Atty. Gen. Fred Howser and Deputy Atty. Gen. Everett Mattoon, for California; Atty. Gen. Hall Hammond of Maryland, chairman of the submerged lands committee, of the National Association of Attorneys General; and Walter R. Johnson, former attorney general of Nebraska, retained by the states to work for tidelands legislation.

The group met with Rayburn May 31 for an initial discussion of the problem, and the following day held another conference at which Clark and Krug were present, returning to the Capitol again June 2 to submit their draft proposals.

Federal Men Noncommittal

There was no indication that either Clark or Krug made any suggestions as to what the administration might be willing to accept in the way of a compromise, but told the group its proposals would be studied. Previously, both officials had indicated they saw little reason or chance for the administration to make any concessions, but the entry of politically powerful Rayburn into the picture materially improved the state's chances that President Truman, who heretofore has been insistent upon federal ownership of all offshore oil, might be influenced to accept an agreement that would end the present stalemate in Congress over enactment of legislation dealing with the tidelands.

At a press conference June 2, the President asked whether he would accept a compromise, was noncommittal, telling newsmen he would consider the question when legislation was presented to him.

The proposed compromise might be embodied in a compact between the federal Government and the states, the latter being given 2 or 3 years in which to accept it. This would afford the states an opportunity to fight the Supreme Court suits and also to continue to work for quitclaim legislation in the event those suits went against them.

The compact would state definitely that the federal Government has paramount rights within the now-claimed borders of the states with respect to navigation, national defense, and other matters over which it normally has jurisdiction, and a paramount right to all the offshore production in times of emergency for meeting the needs of national defense.

It would give ratifying states the right to lease and develop their offshore lands, regulate the production, tax the developments, and retain funds derived from leases and production royalties, subject to any split of the revenues between the state and the federal Government that might be agreed upon.

The states, however, would insist that the compact legislation carry definite assurance that the federal Government will not move in on their inland waters or upland oil fields and that their rights to their present boundaries—3 miles generally, 10½ in the case of Texas—be recognized.

The discussions indicated that Louisiana is more willing than Texas to make a trade. Popular opinion in Texas is against conceding anything, but officials appear to have little confidence that the Supreme Court would not find some way of getting around the annexation agreement on which the state depends as its defense to the suit.

Takes Heat Off Congress

One big advantage of a compromise would be that it would take the heat off Congress and place the burden of deciding the issue upon the state legislatures. Rayburn told the group he is tired of the subject, which has been before two Congresses, and would like to see it disposed of. There is no chance of any legislation—either quitclaiming the Government's interest in the tidelands or providing for federal administration—this year, and that situation is so widely accepted that congressional committees have not even touched the subject.

If a compromise can be worked out, efforts will be made to secure the necessary legislation before the end of the session, although this would take some doing as committee hearings undoubtedly would see a revival of the fight which was waged in the Eightieth Congress, which was marked

by charges of "oil monopoly" and "oil steal."

On the other hand, some of the state officials were reportedly cool to the idea of embodying the agreement in a compact which they feared might foreclose the door to quitclaim action by a favorable Congress once it was accepted by the states.

This attitude led to some idea that Sen. Joseph C. O'Mahoney of Wyoming, chairman of the Senate committee which would handle the legislation, who sat in on the meeting attended by Clark and Krug, might come up with legislation which would not require affirmative action by the states. Since one Congress cannot bind succeeding Congresses, such a measure, if not entirely satisfactory to the states, might be repealed or amended some time in the future should a favorable opportunity arise.

In either event, the final word would be said by President Truman. The major hope for changing the President's position is in the exercise by Rayburn of his influence at the White House. As Speaker of the House, Rayburn is in a pivotal position where he can make things tough for the administration or do much to smooth its legislative path in the lower chamber.

Gas Transmission Lines Increasing In Efficiency, A. & I. Group Told

KINGSVILLE, Tex. — A prediction of additional capacities and increased economics of investment and operation for the gas-transmission industry was made here this week by R. H. Hargrove, president of Texas Eastern Transmission Corp. Technical developments such as larger diameter pipes, improved construction and operating techniques, higher-yield pipe, and more efficient or new-type compressors would make these advances possible, Hargrove said.

The "Big Inch" president spoke before 190 engineers and operating men attending the fourth annual gas technology short course of the Texas College of Arts and Industries. Fifteen states and Mexico were represented among the registrants.

In his address, Hargrove emphasized "the great technical strides which have been made in developing and expoiting the chemical uses of gas as a raw material." He predicted an "unusually bright" future in this field and added that "so much research is needed and so many possibilities present themselves that the direction of the future in chemical technology is almost a matter of choice."

Growth of Industry Shown

In calling attention to the size of the gas industry, Hargrove used the following figures: For the year 1947 the American Gas Association reported the sale of more than two and one-half trillion cubic feet of natural gas. The gas so sold was transported through 243,000 miles of main pipe lines, and yielded a total revenue in excess of 848 million dollars. For the same year, the natural gas industry afforded employment to more than 92,500 persons, to whom it paid $262,374,000 in wages, an average of about $2,840 per person per year. The total assets of all companies classified as "natural gas companies" by the Federal Power Commission amounted, at the end of 1947, to more than four billion dollars, of which almost 120 million dollars represented cash on hand and in banks. These companies earned for their stockholder owners a total of more than 150 million dollars of net income for the year 1947.

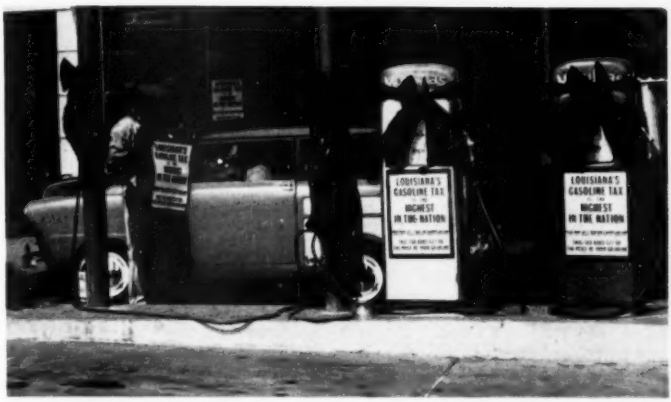
In the discussion following the eight papers presented on gas production and transmission, two themes were dominant. The first was the fact that the operation of centrifugal compressors with gas turbines appears to be the answer to great growth in the gas-transmission industry. The second theme was that the catalytic cracking of natural gas in the newer types of catalytic crackers will allow pipe lines to operate at a high load factor. As discussed, the industry would use straight natural gas, without cracking, in the winter and use the cracked gas in the summer.

Many Papers Presented

Frank H. Dotterweich, director of the Texas A. & I. division of engineering, headed the administrative committee for the 3-day meeting. C. R. Williams, vice president of The Chicago Corp., Corpus Christi, was the advisory committee chairman. Richard M. Kleberg, chairman of the board, King Ranch, Kingsville, was the featured speaker at the banquet.

Gas production and transmission papers presented during the 3-day meeting included the following: "Natural Gas Hydrates," Joseph D. Parent, Institute of Gas Technology, Chicago; "Mechanical Removal of Entrained Materials From Natural Gas," Jay A. Rossiter, Thermix Corp., Houston; "Engineering and Regulatory Aspects of Long-Line Contracts," C. L. Brockschmidt, Texas Eastern Transmission Corp., Shreveport; "Selection of Reciprocating Compressors," B. T. Mast, Tennessee Gas Transmission Co., Houston; "Operation of Centrifugal Compressors and Gas Turbines," O. H. Moore, Tennessee Gas Transmission Co., Houston; "Conservation of Natural Gas," Charles B. Johnson, Jr., The Chicago Corp., Corpus Christi; "Acidizing of Wells," Jack Talbot, Dowell Incorporated, Alice, Tex.; and "Phase Behavior of Natural Gas and Condensate Systems," J. Paul Sloan, Gulf Oil Corp., Houston.

"BLACK TUESDAY" IN LOUISIANA



Filling stations in Louisiana were draped in black on June 7, the first anniversary of the date the state legislature raised Louisiana's retail gasoline tax to 9 cents per gallon. This was part of the drive being made by the Louisiana Petroleum Industries Committee to secure a reduction in the tax

New California Gravity Scale May Set Crude-Price Pattern

by Henry D. Ralph

THE complete revision of the gravity schedule of prices for California crude oil which was made effective June 1 by Standard Oil Co. of California is creating considerable interest in other crude-producing areas because it may possibly set a pattern for similar action elsewhere.

Standard raised the postings on many crudes of high gravity, lowered them on most heavy crudes, and made adjustments in the gravity scale of prices in virtually every field where it purchases.

The objective of this revision is to obtain larger volumes of the light crudes which have the highest yields of gasoline and heating oils and to reduce takings of heavy crudes which yield chiefly residual fuel oil. This is in line with the trend in petroleum-products markets, where gasoline in general has been firm in price while heavy fuel oil has been declining.

Standard of California made a reduction of 15 cents per barrel in its price of heavy fuel oil at the same time it announced its new schedule of crude postings. This is the third substantial drop in prices of industrial fuel oils made by this company since the first of the year, totaling 60 cents per barrel for the heaviest grades.

Mixed Trend Shown

The new crude postings make it difficult to determine whether California crude prices as a whole have been raised or lowered, though it is probable that a weighted average of all production would show that producers will receive somewhat lower returns. The accompanying table shows that in a couple of fields the highest gravity crudes have been raised as much as 26 and 28 cents per barrel, whereas some very heavy crudes have been cut as much as 95 cents per barrel since the first of the year.

In other parts of the country there have been numerous reductions in the postings for heavy crudes, but there has not yet been a complete revision of gravity schedules similar to that in California. Most of these reductions have been flat cuts, usually 25 cents per barrel, in the price of crude below a certain gravity, or for an entire field where the average gravity was low. Such price reductions have occurred particularly in Mississippi and northeastern Texas fields. In Wyoming and Oklahoma the reduction was accomplished by broader graduations over the heavier-gravity crudes.

In most fields the prevailing practice has been to graduate the price the same number of cents for each degree change in gravity. The new California schedules, however, use a sliding scale of price changes, with the graduations greater at the heavy end of the gravity scale.

Might Be Used Elsewhere

If crude buyers throughout the country should make revisions both upward and downward in their gravity scales similar to the pattern of Standard of California it might have the effect of reducing production of crudes which are economically less valuable at present without affecting the output of crudes with the highest yields of gasoline which currently is the product in greatest demand and bringing the best returns to refiners.

Most crude-price changes in the past few years have been flat jumps, without much regard to gravity or product yield. Gravity schedules, and price differentials based on accessibility of the various fields, remained virtually unchanged in these flat price increases and decreases, though the conditions under which they were established might have been altered during the years.

Based on Market Values

The action of Standard of California appears to be an attempt to reprice all crudes on the basis of their current market values, considering costs of transportation and processing and the price returns from the products they can be made to yield.

The accompanying table, taken from Standard of California's June 1 postings, shows the high and low range of gravity and posted price for each field, the change from the last previous posting (May 20 for most fields), and how the new high and low postings compare with crude prices in effect prior to the first of this year when downward revisions began in prices of California crudes. The complete new gravity scale for a typical field, Signal Hill, is given in the statistical section on page 159.

Field—	Gravity range	New posting		Change from last posting (cents)		Change so far this year (cents)	
		Low	High	Low	High	Low	High
Signal Hill (Long Beach)	18-32.9	$1.78	$2.64	—18	+ 2	—39	+ 2
Wilmington	14-31.9	1.63	2.61		+ 1	—50	+ 1
El Segundo	14-28.9	1.39	2.37	—21	— 6	—76	— 6
Seal Beach	22-35.9	2.10	2.78	— 9	+ 3	— 9	+ 3
Huntington Beach	14-30.9	1.61	2.51		+ 1	—55	+ 1
Inglewood	14-31.9	1.63	2.56		+ 3	—55	+ 3
Brea-Olinda	14-28.9	1.48	2.56	—12	+ 7	—67	+ 7
Athens-Rosecrans	27-34.9	2.36	2.75	— 2	+ 9	— 2	+ 9
Torrance	14-28.9	1.57	2.35	— 3	— 9	—58	— 9
Richfield	14-26.9	1.51	2.36	— 9	— 7	—64	— 7
Whittier, East Coyote (La Habra)	14-27.9	1.60	2.43		+ 1	—55	+ 1
Montebello	14-40.9	1.62	2.99		+15	—55	+15
West Coyote Hills	22-35.9	2.13	2.70	—14	+ 7	—14	+ 7
Santa Fe Springs	27-34.9	2.43	2.73	+ 4	+ 8	+ 4	+ 8
Leffingwell	32-38.9	2.53	2.80	— 3		— 3	
Newport-Anaheim Sugar area	14-25.9	1.38	2.01	—15	—36	—70	—36
Newport—other than Anaheim Sugar area	14-23.9	1.56	2.24	— 5	—11	—60	—11
Aliso Canyon	17-30.9	1.83	2.79	— 4	+26	—32	+26
Del Valle	25-34.9	2.09	2.67	—17	+ 8	—17	+ 8
Kern River, Kern Front, McKittrick, Round Mountain, Mount Poso	12-18.9	1.33	1.88	—13	— 9	—83	—34
Greeley, Wasco, Coles Levee, Elk Hills (Stevens zone)	27-40.9	2.20	2.84	— 5	+16	— 5	+16
Mountain View	19-35.9	1.75	2.69	—28	+ 1	—46	+ 1
Elk Hills (Shallow), Buena Vista Hills, Midway-Sunset, Lake View area	12-31.9	1.42	2.66	— 4	+ 4	—74	+ 4
Lost Hills	12-30.9	1.39	2.50	— 7	+ 5	—77	+ 5
Coalinga, Raisin City, Pleasant Valley	12-40.9	1.45	2.89	— 1	+21	—71	+21
Wheeler Ridge	20-24.9	2.00	2.26	—10	+ 4	—16	+ 6
Kettleman Hills	31-40.9	2.47	2.92	+ 7	+16	+ 7	+16
Canfield Ranch	24-28.9	2.22	2.34	— 3	— 1	— 3	— 1
Cymric	12-40.9	1.39	2.94	— 7	+28	—77	+28
Edison	14-22.9	1.42	2.09	—21	—11	—74	—17
McClung	28-31.9	2.17	2.35	—12	— 4	—12	— 4
Guijarral Hills	35-40.9	2.62	2.87	+ 6	+11	+ 6	+11
Elwood Terrace (f.o.b. ship)	33-36.9	2.66	2.80	+11	+13	+11	+13
Gato Ridge	12-18.9	0.99	1.46			—95	—56
West Cat Canyon-Los Flores	12-15.9	1.01	1.27			—95	—74
Santa Maria Valley	12-19.9	1.04	1.58			—95	—50
Montalvo West	28-40.9	2.37	2.92	— 6	+ 7	— 6	+ 7

this week

CRUDE OIL—California buyers announce new schedules involving price reductions in low-gravity crudes and advances in high-gravity grades. . . . First major effort to reflect changes in refined market conditions in all grades of crude. . . . ¶Failure of Louisiana, Arkansas, and Mississippi conservation officials to restrict output brings 15 per cent curtailment in purchases by large buyer. . . . Stripper wells and special situations involving waste not included in this first important pipe-line curtailment of purchases. . . . ¶Oklahoma state conservation officials urge crude buyers not to purchase in excess of allowables. . . . Recent Oklahoma output about 30,000 bbl. daily in excess of state allowable for May. . . .

TIDELANDS—Tentative compromise of state-federal controversy over control of offshore oil drafted in Washington. . . . Outline still has gaps to be filled. . . . None of the parties is enthusiastic over the draft. . . . Prospect for adoption is doubtful. . . .

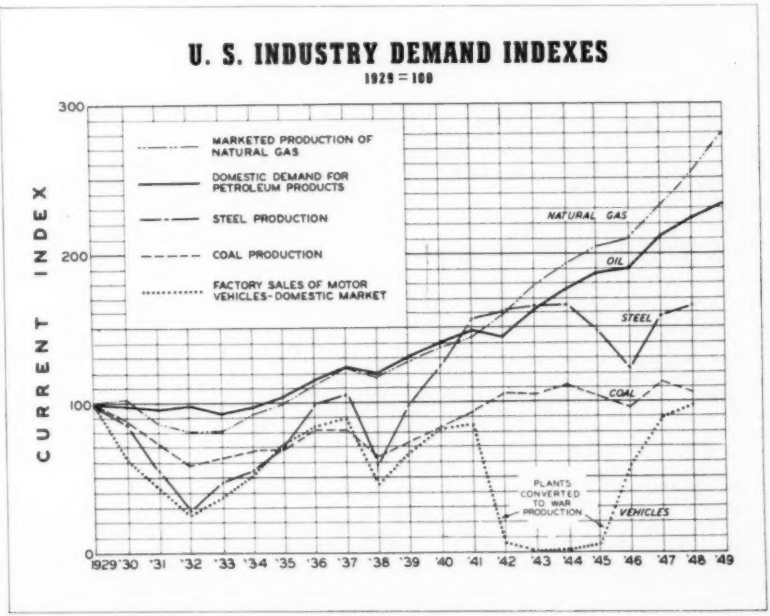
FOREIGN TRADE—Hallanan says industry must keep faith with its policy declaration by voluntarily reducing oil imports further. . . . ¶Argentina and United Kingdom sign trade agreement which apparently shuts dollar oil out of the Argentine. . . . ¶Marshall plan countries are expected to increase their imports of crude and refined products substantially. . . . ¶Senate opposition rising toward extension of reciprocal trade agreements authority without curtailment of administration's powers to sanction imports. . . .

TRENDS—Crude-oil production in May averaged 4,912,000 bbl. daily or about 10 per cent less than the same month last year. . . . ¶Current reports indicate crude stock increases of about 150,000 bbl. daily during May. . . . Crude-oil stock reductions of May of last year averaged 103,000 bbl. per day. . . . ¶Refinery runs of domestic crude for past 4 weeks were 9.3 per cent below same period in 1948. . . . Runs of foreign crude were up 22 per cent. . . . ¶Most suppliers believe summer deliveries of heating distillates will increase under recent plans to protect resellers against price rises this summer. . . .

INTERNATIONAL—Mexico discovers high-gravity crude in Isthmus area. . . . ¶Germans make discovery near Dutch border. . . . ¶Shake-up in Venezuelan cabinet may affect oil operations. . . . ¶Exploratory work continues high in Venezuela, though fewer rigs are running. . . . ¶International Bank will make survey of Colombia's economy. . . . ¶Sinclair surrenders Panamanian concession after unsuccessful wildcatting. . . .

NATURAL GAS—Economics and technology favor continued big growth in long-distance gas transmission. . . . Turbine driven centrifugal compressors and catalytic cracking of gas promise greater capacities and peak-load operation. . . . ¶Chicago District Pipeline Co. asks FPC authority to build $6,000,000 storage facilities for natural gas in liquid form. . . .

REFINING—Government survey shows refinery workers are third highest paid of skilled trades in nation. . . . ¶Resumption of domestic construction of T.C.C. facilities signaled by Socony-Vacuum's announcement of plans to construct four new units. . . . ¶General Petroleum Corp. will increase gasoline production at Torrance, Calif., refinery by 500 bbl. daily. . . .



This chart reflects the strong demand position of petroleum and natural gas in relation to other basic industries. Note comparative trends during depression period of early thirties and "repression" year of 1938. Editorial comment on page 55

Growth in Taxes and Regulation Worry Rocky Mountain Oil Men

COLORADO SPRINGS.—"More than $1,500,000 per month is spent in Rocky Mountain geological and geophysical research, and more than $4,000,000 per month is spent on Rocky Mountain wildcat drilling," said H. C. Teasdell, president of The California Co., in pointing out "What Petroleum Means to the Rocky Mountains" at the midyear meeting of the Rocky Mountain Oil and Gas Association here June 1-2.

The 2-day meeting was attended by more than 200 directors and members of the association and guests. Teasdell pointed to the rapid strides of the petroleum industry and the accomplishments, particularly in the Rocky Mountains, in the economic progress of the region and nation. He said that when historians write the current chapter of history it could properly be called the "Petroleum Age," because petroleum has made possible the industrial growth characteristic of our times. At present, he said, excessive taxation is threatening the petroleum industry as well as the free enterprise system necessary as the incentive for proper development of the industry. "Tax away rewards and you stop development," Teasdell declared.

Coincidence Is Noted

Russell B. Brown, general counsel of the Independent Petroleum Association of America, in speaking to the meeting concerning market outlet called attention to the fact that the I.P.A.A. was organized on June 10, 1929, at the Broadmoor Hotel, in the same room where the R.M.O.G.A. meeting was being held. At that meeting Secretary of the Interior Ray Lyman Wilbur told them: "It is also acknowledged that there is a limited supply of oil available. Estimates vary but those most expert in the field expect our present volume of production to last for less than a decade."

Brown called attention to the production then of 2,724,450 bbl. daily, compared with the present production rate of nearly 5,000,000 bbl. daily, and that petroleum reserves are higher now than ever before. This illustration was used in pointing to the cooperation needed in considering present-day national market problems. Brown said that our market problems will not be solved by individual effort, but by cooperative study, and that there is a danger of wrong ideas on national oil supply, particularly of some individuals within the industry itself.

The meeting was opened by Glenn E. Nielson, president of the association and of Husky Refining Co., Cody, Wyo. Nielson said that "the oil industry in the West faces the problem of being far from markets, adding to transportation costs. If the industry here is taxed excessively, cutbacks in production will occur. The oil industry is willing to bear its share of taxation but we are concerned for the future of free enterprise if the present trend continues."

R. B. Curran, vice president of the association, who was recently made western manager for Imperial Oil, Ltd., at Calgary, presided at the meetings. Curran said "there is a movement in this country toward governmental control and it is up to us to try to keep the Republic given us."

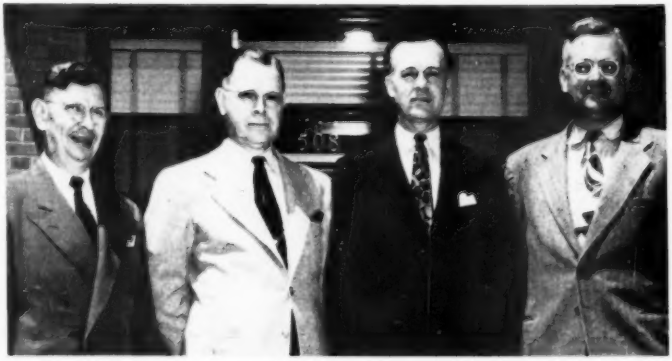
During the meeting methods were discussed for participation by the association in an informational program within the Rocky Mountain region to acquaint the public with the work being done by the industry. Hume Everett, Rocky Mountain counsel for Ohio Oil Co., spoke to the group on "From the Grass Roots up," and discussed the need for a campaign along these lines. Paul Hirth, chairman of the Rocky Mountain Oil Industry Information Committee, told delegates at the meeting that "the American people must be on their guard against the subtle ways in which the enemies of democracy are attempting to destroy our free-enterprise system." He outlined work now being done by his committee to acquaint the public with the oil industry.

The Honorable N. E. Tanner, Minister of Natural Resources, Edmonton, Alta., spoke of the friendly relations between Americans and Canadians, and said "it would do the world good to see the 'unfortified' boundary between the United States and Canada." In reviewing recent oil developments in Alberta he said that the province owns approximately 90 per cent of the mineral rights, with the balance privately owned. He outlined methods for prospecting and leasing the lands and said that American capital is welcome in Alberta.

"Individual enterprise is best for continuing our way of life," said Tanner, and "there is no place else in the whole world where we can enjoy life as here in the North American continent." In discussing the Alberta oil picture he said that their first desire is to supply the needs of Canada. Production in the province is now at the point where it can supply its own demands, and Tanner referred to the proposed Imperial pipe line to Regina and the probability that a line would then be built eastward. He outlined the powers of the Alberta Oil Conservation Board, but said that those powers would not be used unwisely.

Important sessions of the association's legal and legislative, and public lands committee were held, with primary consideration given to the new form of unit plan recently proposed to the industry by the U. S. Interior Department.

KANSAS GEOLOGICAL SOCIETY OPENS NEW BUILDING



The Kansas Geological Society officially opened its new building at Emporia and Murdock streets in Wichita, May 27. The society is the first local geological group to own its own building. The new structure will serve as the permanent home of the Kansas Well Log Bureau, Kansas Well Sample Bureau, and other public-service facilities of the society. Before the doorway of the new building are, left to right: Don W. Payne, president of Kansas Geological Society; L. C. Hay, director; Harvel E. White, manager; and E. Gail Carpenter, chairman of the building committee. Photo courtesy The Wichita Beacon

California representatives at the production-engineering conference of Gulf Oil Corp. held in Pittsburgh May 23-27. Left to right: C. J. Smith, chief chemist, Paloma plant; J. R. Weaver, superintendent, Paloma; E. W. Walker, chief mechanical engineer, Los Angeles; G. V. Kersten, district production engineer, Bakersfield; J. H. Starbird, production engineer, Paloma; E. A. Galvin, chief production engineer, Los Angeles; George Hetherington, production engineer, Los Angeles; and C. J. Livingstone, assistant to the executive vice president, Gulf Research & Development Co., of Harmarsville, Pa.

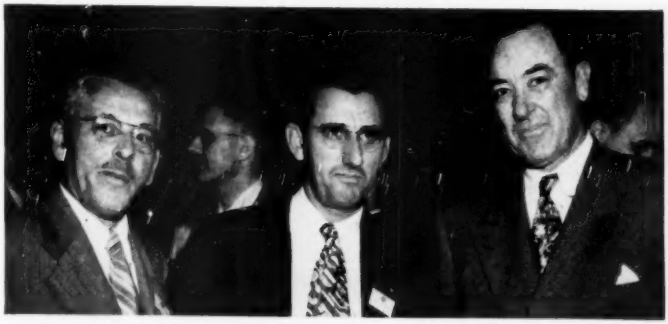
Gulf Men Study Production Problems

THIRTY-FIVE papers dealing with latest developments of petroleum production, drilling techniques, well-logging methods for determining geological-formation characteristics, and subsurface corrosion were presented at the seven technical sessions of Gulf Oil Corp.'s production-engineers meeting, held at Hotel William Penn in Pittsburgh May 23-27. Also included were discussions on nature and performance of drilling fluids, and engineering and economic aspects of petroleum-reservoir operations.

The meeting, attended by 180 engineers, technical specialists, and officials representing Gulf in the United States, Canada, South America, Europe, and the Middle East, was the largest ever held by the company, and was the fifth in a series inaugurated before the war to study petroleum-engineering problems and exchange information on production operations. Due to the unusually large attendance, sessions were held at the hotel rather than at Gulf's research laboratories at nearby Harmarville, Pa., as in the past.

Because of high costs of drilling wells to deeper horizons, problems associated with drilling were given emphasis in the form of detailed studies in drilling time, costs of rig operation, fishing operations, coring, and lost circulation.

The technical program also included tours through the research laboratories. In addition to production personnel from the corporation's general offices in Pittsburgh and from Gulf Research & Development Co., the conference brought together representatives of Gulf's Tulsa, Houston, and New York operating divisions, and of Western Gulf Oil Co., Mene Grande Oil Co., C. A., and Kuwait Oil Co., Ltd.



Dr. Paul D. Foote, left, executive vice president of Gulf Research & Development Co., is shown with E. E. Ferrin, center, chief petroleum engineer at Kuwait, and E. P. Hubbard, superintendent of production for Gulf's Houston district, at the Pittsburgh meeting

Helen Van Horn, interpreter's assistant (on table) is shown using Shoran plotting device on airborne magnetometer prospecting reports at Gulf research laboratories, Harmarville, Pa., recording data in response to controls operated by women in foreground. Others are left to right: J. R. Haggblom, Gulf Research & Development Co., Harmarsville; R. M. Dillard, plant superintendent, Paloma, Calif.; R. Alford, petroleum engineer, San Tome, Venezuela; S. W. Miller, field petroleum engineer, Thompsons, Tex.; R. E. Johnson, Jr., division drilling engineer, San Tome; and Gordon James, district petroleum engineer, Houston

Refinery Workers Third Highest Paid in Country, Survey Shows

WASHINGTON. — Average hourly earnings of refinery workers are the third highest in American industry, being exceeded only by those of coal miners and mechanical employes of newspapers and magazines, the Bureau of Labor Statistics reported last week.

A study of 122 refineries with over 100,000 employes, all plants with more than 50 workers, showed that straight-time average hourly earnings last September were $1.78 an hour, with about three-fourths of the workers earning between $1.50 and $2.10 an hour.

The survey showed that laborers in the industry averaged $1.42 and occupational averages ranged up to $2.18 for stillmen operating continuous units. Skilled maintenance workers averaged about $2 an hour and their helpers $1.67.

The bureau found that, on the average, earnings were highest in the Great Lakes region and lowest in the Middle West, but the variation in average earnings amounted to 6 cents an hour or less among five of the seven regions into which the country was divided for purposes of the study. As was to be expected, refineries in the larger cities paid higher rates for comparable jobs than plants in smaller communities, and refineries employing over 500 workers had a higher wage level than smaller establishments.

The over-all wage level for the 109,459 workers covered by the survey ranged from $1.71 in the Middle West to $1.84 in the Great Lakes region. The lowest wage rate reported was $1.34 for janitors in the Mountain region, and the highest was $2.22 for stillmen on combination units in the Great Lakes region.

The bureau found that in addition to relatively liberal vacation, sick-leave, and paid-holiday practices, nearly all of the refineries had some type of insurance and pension plans. Over 60 per cent of the plants studied made provisions for the payment of old-age pensions, it said.

Detailed information based on the survey will be published in a bulletin in the near future. The accompanying table, however, shows the average straight-time earnings (excluding premium pay for overtime and night work) for selected occupations for the country as a whole.

STRAIGHT-TIME AVERAGE HOURLY EARNINGS FOR SELECTED OCCUPATIONS IN PETROLEUM REFINING INDUSTRY, SEPTEMBER 1948

Occupation—	No. of workers	Average hourly rates
All plant workers	109,459	$1.78
Assistant stillmen, cracking	2,781	1.95
Assistant stillmen, straight-run	1,231	1.91
Assistant stillmen, combination units	702	1.97
Carpenters, maintenance	1,630	1.98
Centrifuge operators	174	1.80
Chiller men	178	1.91
Compounders	347	1.86
Electricians, maintenance	1,280	2.01
Filtermen	342	1.75
Firemen, stills, cracking	1,478	1.84
Firemen, stills, straightrun	736	1.76
Firemen, stills, combination units	398	1.87
Gagers	1,354	1.87
Guards	1,045	1.66
Helpers, maintenance	11,736	1.67
Instrument repairmen	1,043	2.01
Janitors	815	1.44
Laborers	15,810	1.42
Loaders, tank cars or trucks	1,483	1.70
Machinists, maintenance	2,693	2.01
Maintenance men	198	1.74
Mechanics, maintenance	584	1.92
Package fillers, machine	586	1.58
Packers, hand	1,098	1.66
Pipefitters	3,202	1.98
Pressmen, paraffin	484	1.68
Pumpmen	2,684	1.92
Pumpmen's helpers	1,104	1.83
Routine testers, laboratory	3,106	1.77
Stillmen, cracking	1,620	2.15
Stillmen, straightrun	1,148	2.07
Stillmen, combination units	470	2.18
Stock clerks	518	1.73
Treaters, light oils	856	1.96
Treaters, heavy oils	220	1.97
Treaters' helpers, light oils	670	1.89
Treaters' helpers, heavy oils	186	1.86
Truck drivers, under 2½ tons	979	1.68
Truck drivers, 2½ tons and over	810	1.60
Watchmen	684	1.55
Welders, hand, maintenance	1,885	2.02

LARGEST IN THE WEST

The largest pressure storage tank west of the Rockies is shown here under construction for General Petroleum Corp. at its tank farm at Torrance, Calif., to hold casing-head gasoline. Its capacity will be 50,000 bbl., and its operating pressure about 15 psig. In shape the tank is a roofed spheroid, an unusual shape and the first of its kind in California. Engineering is by General Petroleum and construction by Chicago Bridge & Iron Co. It is scheduled for completion in July

Phillips Petroleum to Get Oil Interests in Canada

Phillips Petroleum Co., Bartlesville, Okla., has joined with Husky Refining Co., Cody, Wyo., and Husky Oil & Refining, Ltd., Calgary, Alta., Canada, in an agreement whereby Phillips will acquire an undivided one-half interest in all of the petroleum and natural-gas rights of the Husky companies in the Provinces of Alberta and Saskatchewan. Excepted are the black-oil rights in the Cretaceous formation of the Lloydminster area.

K. S. Adams, Phillips president, announced that the deal involves rights under approximately 4,850,000 acres of lands in the two provinces. Phillips and Husky have agreed on an extensive program for the joint maintenance, exploration, and development of the properties, Adams reported.

Senate Passes Bill to Relieve Basing-Point Price Confusion

WASHINGTON.—The Senate last week passed legislation designed to clear up the basing-point pricing muddle created by the Supreme Court's decision last year in the Cement Institute case.

By some clever drafting on the part of Sen. Joseph C. O'Mahoney of Wyoming, the Senate was able to adopt permanent legislation outlining the manner in which manufacturers may quote delivered prices and absorb freight, instead of providing merely a moratorium until July 1, 1950, to give Congress further time to study the problem, as originally proposed.

Efforts will be made to get the measure up in the House for approval before the end of the session, but a sharp fight is in prospect, to be led by Rep. Wright Patman of Texas, chairman of the small business committee. The Federal Trade Commission, with the exception of Acting Chairman Lowell Maston, also has opposed any legislation on basing-point prices, contending that it is unnecessary.

FTC Restricted

The O'Mahoney substitute for a moratorium definitely restricts the field of FTC authority by amending the Federal Trade Commission Act to provide that "it shall not be an unfair method of competition or an unfair or deceptive act or practice for a seller, acting independently, to quote or sell at delivered prices or to absorb freight: Provided, that this shall not make lawful any combination, consipracy, or collusive agreement; or any monopolistic, oppressive, deceptive, or fraudulent practice, carried out by or involving the use of delivered prices or freight absorption."

This amendment is supplemented by amendments to Clayton Act setting forth the conditions under which a seller may quote delivered prices, as follows:

"It shall not be unlawful discrimination in price for a seller, acting independently—

"A. To quote or sell at delivered prices if such prices are identical at different delivery points or if differences between such prices are not such that their effect upon competition may be that prohibited by this section; or

"B. To absorb freight to meet the equally low price of a competitor in good faith (except where the effect of such absorption of freight will be to substantially lessen competition), and this may include the maintenance, above or below the price of such competitor, of a differential in price which such seller customarily maintains."

A further amendment to the Clayton Act places upon the seller the burden of justifying a discrimination in price of which the FTC can show proof, but provides the seller may justify a discrimination, other than one which would substantially lessen competition, by showing it was made in good faith to meet the price of a competitor.

The bill defines the term "delivered price" as a price at which a seller makes or offers to make delivery of a commodity to a buyer at any delivery point other than the seller's own place of business.

The term "absorb freight" is defined to mean "to establish for any commodity at any delivery point a delivered price which, although as high as or higher than the seller's price for the same commodity at the point from which such commodity is shipped, is lower than the sum of the seller's price for such commodity at such point of shipment plus the actual cost to the seller for transportation of such commodity from such point of shipment to the delivery point or the average cost of transportation to the seller."

The situation which led to months of study of the basing-point problem by congressional committees was created just about a year ago by the Supreme Court's ruling on charges by the Federal Trade Commission that the Cement Institute and its members had conspired to fix prices by the use of a basing-point system. The court held the commission had proved its case, but explained its findings in such abstruse language that neither the members of the commission nor lawyers generally were able to say definitely just what the situation was with respect to delivered prices of all types.

The steel and cement industries, among others, have abandoned delivered-price quotations, an action which had little effect upon their business since at the time those commodities were in short supply, but some 50 other industries, the oil industry included, found themselves in a dilemma, particularly manufacturers who advertised their products nationally at the same prices all over the country, such as candy-bar makers.

On the basis of the court's decision, the commission was disclosed later last year to be studying the so-called Group 3 prices of the southwestern refiners, which cover shipments from the Oklahoma refineries to the Middle West. The FTC had studied the Group 3 situation in the past and has always been suspicious of the oil industry because all service stations in a given area customarily quote identical prices for gasoline and all fuel-oil dealers have the same price for heating oils.

While the industry contends that identical prices are the result of competition which makes it impossible for one seller to ask more than his competitors, it was the contention of the commission that identical prices, however reached, are illegal per se.

Complaints that entire industries might be forced to relocate if the court's decision became law led congressional committees to investigate the situation.

Next Week

New Plant, Sid Richardson Gasoline Co.—Of ultramodern design, this new major installation in Keystone field in West Texas will recover 98 per cent or more butane and 75 per cent propane. Article gives equipment and process data.

Oil-Recovery Prediction.—By two petroleum engineers with Phillips Petroleum Co., this report may rank as furnishing some of the most usable material extant. Two large nomographic charts permit ready computation of oil recovery (as barrels per acre-foot) from reservoir data.

Permeability from Electric Log Data?—M. P. Tixier, Rocky Mountain manager for Schlumberger Well Surveying Corp., discloses new method of determining the permeability from electric-log resistivity gradients. Empirical formulas are given relating electric-log resistivities, water saturations, capillary pressures, and permeabilities.

Rotary Drilling Power Requirements.—Discussion of relative hoisting times, fuel consumption, mud-pump requirements, as related to different sizes of rigs.

Lube-Oil Manufacturing Plants.—Recent data covering the United States lubricating oil plants as to classification by sizes, by geographical distribution, and by types of processes employed.

Closer Well Spacing for Certain Conditions.—A discussion devoted to the application of "in-fill drilling" in older fields having lenticular sand lenses, relation of economic factors, drainage rates, etc.

PERSONALS

Wynn Directs Operation Of Big D-X Refinery

MID-CONTINENT PETROLEUM CORP.'S refinery at West Tulsa has been placed in complete charge of G. E. Wynn, newly elected vice president in charge of manufacturing for the company, who will direct all operating departments. He formerly served as general superintendent of the plant.

Wynn, a graduate of the University of Kansas in 1924, joined Mid-Continent Petroleum the same year as a utility engineer, dealing with requirements and consumption of gas, fuel oil, steam, water, and electricity used in operation of the refinery. In 1935 he was named engineer in the planning and development department, and 2½ years later became superintendent of that department.

Late in 1938 he was named to supervise the operating departments of the refinery, and on February 19, 1942, he became assistant general superintendent. He was named general superintendent of the plant in 1945.

The company recently increased capacity of its refinery at West Tulsa by 36 per cent, with installation of new catalytic cracking units and other modernization. Present capacity is 45,000 bbl. of crude oil daily, and the expansion program required an expenditure of approximately $8,500,000.

Frederick C. Beleau has been named division drilling superintendent for Canadian operations of Stanolind Oil & Gas Co. He formerly was division drilling superintendent for the company's Rocky Mountain area, with headquarters at Casper, Wyo. Other men just assigned to Canadian operations and headquartered in Calgary, Alta., include: **Clarence J. Jinkins,** tool pusher, transferred from Houston; **Truman C. Harman,** farm boss, transferred from Wink, Tex.; **Forrest G. Vergne,** field clerk, moved from Rangely, Colo.; and **Raymond T. Stotler, Jr.,** geologist, transferred from Wichita.

William Ramsay Gray, geologist for Sun Oil Co. at Dallas, has been moved to San Antonio, where he is engaged in stratigraphic research and micro work.

W. H. Newman has assumed the duties of marine drilling tools supervisor in the Louisiana-Gulf district for Magnolia Petroleum Co., with headquarters at Morgan City, La. **Howard M. Walker,** formerly assistant district superintendent in the Duncan, Okla., district, has been transferred to the Lake Charles, La., district, in the same capacity. **Charles B. Swain** succeeds Walker at Duncan.

John Vick, production foreman at Worland, Wyo., for General Petroleum Corp., has been named production foreman for the company at Cole Creek, Wyo. **Wallace O. DeVries,** subforeman at Worland, has been named production foreman at the same location.

C. P. Lowerse, manager of the newly completed Cardon refinery of Shell Venezuela Co., Ltd., was recently invested by the Netherlands Minister to Venezuela with the Knighthood of the Order of Orange Nassau.

L. A. Pattillo has been appointed chief clerk of the Houston district for United Gas Pipe Line Co. and the Union Producing Co. He moves to Houston from Shreveport.

Joe Thomasson, supervisor of operations at Craig, Colo., for Stanolind Pipe Line Co., has been moved to Hays, Kans., as supervisor of operations for the Gorham district.

L. T. Haugen, marine superintendent for Stanolind Oil & Gas Co. at Houston, has joined U. S. Pipe & Foundry Co. as assistant chief engineer in design and manufacture of oilfield pipe, with headquarters at Burlington, N. J.

J. D. Castner, engineer for Illinois water-flood district, Sohio Petroleum Co., has been transferred to the company's Kentucky water-flood district at Owensboro, Ky., as superintendent.

W. Spencer Cook, Allegan, Mich., drilling contractor and independent oil producer, has incorporated his business with Cook as president; **Lee Cook,** vice president and general manager; and **Balsar Cook,** secretary-treasurer.

Howard H. Lester, assistant district geologist for Shell Oil Co., Inc., at Tyler, Tex., has been promoted to district geologist at Corpus Christi. He has been with the company since 1936.

Wright Bradley, petroleum engineer for General Petroleum Corp. in the Rocky Mountain area, has been transferred to the parent company, Socony-Vacuum Oil Co., Inc., at Calgary, Alta., Canada.

Col. Robert W. McClenahan, of the production department of Gulf Oil Corp., Pittsburgh, recently received the Order of the British Empire at the British Embassy in Washington in recognition of unusual service during the period prior to the Battle of El Alemein. McClenahan formerly was with American Meter Co. in Philadelphia and New York.

M. C. Leverett, research associate, Humble Oil & Refining Co., has resigned to join Fairchild Engine & Airplane Corp., at Oak Ridge, Tenn. He is a widely known reservoir engineer.

Frank M. Hammer, formerly geologist for Stanolind Oil & Gas Co. at Lake Charles, La., has joined Schermerhorn Oil Corp., Tulsa, as engineer-geologist.

Thomas P. Brooks, chief engineer, Southern Production Co., Inc., Casper, Wyo., has been moved to Parkerton, Wyo., as superintendent of the Rocky Mountain division of the company.

H. J. Struth, veteran oil economist and analyst, has been named assistant director of the Department of Information, American Petroleum Institute, succeeding **Robert E. Allen,** who recently resigned. Struth joined the institute's staff in January, moving to New York City from Dallas. In his new position he will work under direction of **H. B. Miller,** director of the department, and will serve as his administrative aide.

W. D. Maxwell, district superintendent, Carter Oil Co., Great Bend, Kans., has been elected vice chairman of the American Petroleum Institute for Kansas. He is also chairman of the Western Kansas chapter of A.P.I.

H. B. Johnson has resigned as general manager of Haynesville Operators Committee, Haynesville, La., to enter well servicing and workover business in North Louisiana, as vice president and general manager of Butler-Johnson Service Corp. The firm was recently formed and purchased drilling equipment of **G. H. Neighbors,** Shreveport. **J. R. Butler,** Houston, is president of the new company.

E. O. Dunaway has been named agent of the refining department, The Texas Co., Houston, succeeding **F. C. Jones,** who has retired. Dunaway has been with the company 27 years.

Weldon C. Butler, production engineer for Carter Oil Co., has been transferred from Carmi, Ill., to Grand Rapids, Mich., where he will serve the company as district production engineer.

W. T. Cravens has been named assistant general superintendent of the refining division of Cities Service Oil Co., at Bartlesville, Okla. He has been with Cities Service companies for 12 years, and formerly was in the New York City office of Petroleum Advisers, Inc.

John M. Brackenbury, assistant superintendent of Shell Oil Co., Inc.'s Martinez, Calif., refinery, has been appointed superintendent of the Montreal, Que., refinery of Shell Oil Co. of Canada, Ltd. **F. S. Hummel,** Martinez refinery, has been named new department manager of the gaging department, replacing **J. D. Davis,** who is now manager of the catalytic cracking department of Shell's Wilmington refinery.

Dolphe E. Simic, Bay Petroleum Corp., Denver, has been promoted to vice president in charge of exploration for the Bay Petroleum and Chalmette Petroleum Corp. In addition to assuming these duties in the general office, he will retain his previous assignment as chief geologist in charge of the field staff and geological division offices. Simic has been with Bay since 1946, and previously was with Cities Service Co., serving as district geologist in Oklahoma and Texas.

© Bachrach

M. L. GOSNEY

Marvin L. Gosney, since 1941 vice president and treasurer of Sinclair Oil Corp., has been elected executive vice president. Gosney joined Sinclair at Chicago in December 1916 and a year later was made treasurer of Sinclair Refining Co. In 1925 he moved to New York as assistant treasurer of Sinclair Oil Corp. and in 1940 became treasurer. In 1942 he was elected a director of Sinclair Oil. **W. S. Dau** has been elected treasurer of Sinclair Oil succeeding Gosney. He joined Sinclair Refining in 1917 in the accounting department in Chicago. Since 1943 he has been vice president and assistant treasurer of Sinclair Oil Corp.

R. A. Rank, independent geologist, has joined Danciger Oil & Refining Co. at Fort Worth as a geologist.

C. L. Lee, formerly with Texas Petroleum Co., has joined Colombian Petroleum Co. as a geologist.

H. Lem Stevens Guille, formerly president and manager of Madison Natural Gas Co., Ltd., and more recently with Imperial Oil, Ltd.'s, producing department in Toronto, has been placed in charge of the Interprovincial Pipe Line Co.'s operations at the Edmonton, Alberta, office. He began his career in the oil business in Canada as a roughneck in Turner Valley. He was a graduate of the University of Birmingham in England and held the degree of B.Sc. in oil engineering and refining. A native of England, Stevens Guille became chemical engineer at the scrubbing and gasoline plant of the Royalite Oil Co. in Turner Valley. In 1944 he joined the Madison Natural Gas Co. as field superintendent and in 1946 became president and manager. In 1947 he joined Imperial Oil in the western producing department and has since been engaged in engineering duties in a senior capacity.

Ike J. Pierce, district geologist, Phillips Petroleum Co., Evansville, Ind., has been transferred to Calgary, Alta., Canada.

Byron F. Wingrove, chief process engineer for lubricating oil and wax, Magnolia Petroleum Co.'s Beaumont, Tex., refinery, has been transferred to Paulsboro, N. J., refinery of Socony-Vacuum Oil Co., Inc., as assistant to the plant's assistant superintendent in charge of lubricating-oil manufacture. **Francis M. Graves,** as-

Members of the first scout check ever organized in Canada at the June 1 meeting in Calgary, Alta. Left to right: S. L. Camp and H. L. Haag, Shell Oil Co. of Canada, Ltd.; N. W. Taylor, Cities Service Oil Co.; H. A. Baker, Stanolind Oil & Gas Co.; J. W. Clampitt, Amerada Petroleum Corp.; R. W. Barker, Phillips Petroleum Co.; C. R. McLernon, Socony-Vacuum Oil Co., Inc.; J. L. Chisholm, Sun Oil Co., treasurer of the group; Les Croteau, Rio Bravo Oil Co., Ltd., vice president; Phil Lansdell, Shell Oil Co. of Canada, Ltd., president; W. L. McDonald, Bear Oil Co., Ltd.; Harry Alger, Royalite Oil Co., Ltd., secretary; George E. Jones, Royalite Oil Co., Ltd.; and L. E. Diamond, Canadian Gulf Oil Co.

PERSONALS

sistant chief process engineer at Beaumont, has been named chief process engineer replacing Wingrove. **L. D. Lynch** will assume Graves' former duties.

W. A. Bohan, assistant division manager, oil-traffic division, Texas Pipe Line Co., and **John K. McGoldrick,** former president of Texas Pipe Line Co. of Oklahoma before it was taken over by Texas Pipe Line Co., have retired from the company.

J. A. La Fortune, Tulsa, executive vice president and director of Warren Petroleum Corp., has been elected a director of Oklahoma Natural Gas Co. He is a past president of Natural Gasoline Association of America, and a member of American Petroleum Institute's refining committee. He formerly was with Standard Oil Co. (Ind.).

J. H. Schaefer, vice president, Ethyl Corp., was elected president of Industrial Research Institute, Inc., at the institute's annual meeting held at Asbury Park, N. J., recently. *(A discussion of the Industrial Research Institute's functions appeared in The Oil and Gas Journal October 21, 1948, page 67).*

W. G. Iverson has been appointed Kansas district geologist for Continental Oil Co., with offices in Wichita. He replaces **Roger Messman,** who has been promoted to a geological post at the company's Ponca City, Okla., offices.

Henry K. Bosweli, engineer for Stanolind Oil & Gas Co., at Tulsa, has been made plant foreman at Burnell-North Pettus gasoline plant at Pettus, Tex. **F. H. Hammons,** formerly assistant party chief, has been made party chief of a seismograph group at Smithville, Tex.

Arthur Drexel, production foreman, Stanolind Oil & Gas Co., has been transferred from East Texas area, Longview, to North Cowden area, Odessa; **Clinton C. Harbour,** production foreman at Nocona, Tex., has been moved to Longview to replace Drexel; **E. L. Chapin,** petroleum engineer, has transferred from Odessa to Lubbock, and **W. Keith Miller,** geologist, has transferred from Midland, Tex., to Fort Worth. **James J. Johnson,** petroleum engineer at Shreveport, has been moved to Oklahoma City; **William R. Sype,** geologist, has been transferred to Oklahoma City from Tulsa; and **G. N. Meade,** seismograph party chief, has moved to Ardmore, Okla., from Rock Springs, Wyo.

SHIFTS—

Ernest M. Bony, engineer, Shell Oil Co., Inc., Martinez to Berkeley, Calif.; **W. H. Alexander,** foreman, General Petroleum Corp., Bakersfield, Calif., to Fayette, Mo.; **E. J. Anderson,** engineer, Humble Oil & Refining Co., Lolita to Houston, Tex.; **J. J. Pitts,** foreman, Robert H. Ray Co., San Benito to Pharr, Tex.; **H. K. Herr,** foreman, Kerr-McGee Oil Industries, Inc., Abilene, Tex., to McComb, Miss.; **F. P. Henchy,** engineer, Continental Oil Co., Beeville, Tex., to Baton Rouge, La.; **C. J. Wooley, Jr.,** engineer, Humble Oil & Refining Co., Houston, to Katy, Tex.

C. D. Elwell, geologist, Magnolia Petroleum Co., Midland, Tex., to Roswell, N. M.; **Clifton Beall,** foreman, The Texas Co., Port Arthur to Brownsville, Tex.; **J. B. Turner,** superintendent, Sun Pipe Line Co., Delhi to Beaumont, Tex.; **Fred S. Reynolds,** engineer, Humble Oil & Refining Co., New Orleans, La., to Houston; **H. R. Haynes,** superintendent, Wheless Drilling Co., Ruston to Bossier City, La.; **M. M. Laws,** superintendent, Rock Hill Oil Co., Mt Vernon, Ill., to Ardmore, Okla.; **David Culpepper,** superintendent, Culpepper & Arn, Portland to Winchester, Ind.; **G. E. Manger,** geologist, U. S. Geological Survey, Chevy Chase, Md., to Washington, D. C.

J. B. Hessick, foreman, Stanolind Oil & Gas Co., McPherson to Zenith, Kans.; **W. D. Conley,** superintendent, Union Producing Co., Elk City, Okla., to Vivian, La.; **E. R. Hawkins,** superintendent, Rocky Mountain Drilling Co., Winters to Rio Vista, Calif.; **Latham L. Brundred, Jr.,** engineer, Union Oil Co. of Calif., San Marino to Whittier, Calif.; **J. L. Elkin, Jr.,** geologist, Humble Oil & Refining Co., Columbus to Palacios, Tex.; **G. K. Hall,** foreman, Warren Oil Corp., Eliasville to Jacksboro, Tex.; **Burrell F. Latta,** engineer, Halliburton Oil Well Cementing Co., Fullerton, Tex., to Mt. Carmel, Ill.

Lawrence W. Coldren, foreman, Pure Oil Co., Mt. Vernon, Tex., to Fort Worth; **Pete Cawthon, Jr.,** engineer, Phillips Petroleum Co., Odessa to Midland, Tex.; **Joe C. Rolls,** engineer, McClanahan Oil Co., Grand Rapids, Mich., to Amarillo, Tex.; **Howard F. Johnston,** geologist, Quaker State Oil Co., Newark, Ohio, to Parkersburg, W. Va.; **Damon P. Swain, Jr.,** engineer, Stanolind Oil & Gas Co., Stafford to Lyons, Kans.; **L. L. Rone,** superintendent, Kerr-McGee Oil Industries, Inc., Casper, Wyo., to Baker, Mont.; **Harvey Stein,** geologist, Texas Petroleum Co., Colombia, S. A., to Los Angeles, Calif.; **J. H. B. Dudley,** engineer, Socony-Vacuum Oil Co., Inc., Paris, France, to New York, N. Y.; **Frank Rosta, engineer,** M.A.O.R.T., Sojtor, Hungary, to Nagykanizsa, Hungary.

DEATHS

Frank Adair Leovy, 79, for 42 years an employe of Gulf Oil Corp., and for 10 years executive head of the old Gypsy Oil Co., Tulsa, died in Pittsburgh June 2. He retired in 1946 after serving as vice chairman of the board, a director of Gulf, and chairman of the board and director of Gulf Refining Co.

David M. Rhodes, 56, president of Barbara Oil Co., Chicago, died May 31 in Evanston, Ill. A pioneer in Mid-Continent oil development, he joined the company after having been an independent producer for many years.

R. T. Dotson, 43, topping-plant operator at the Refugio, Tex., plant of Bennett Oil & Refining Co., died of injuries received in an explosion and fire at the plant May 27.

O. D. McPherhon, 67, free-lance oilfield accountant, died May 26 in Columbus, Ohio.

James Ernest Mulligan, 87, Tulsa, former office manager for Shell Oil Co., Inc., and veteran of old Roxanna Oil Co., died June 4.

Donald Kelly, 51, Wichita Falls, Tex., independent geologist, died June 1.

Jessie Ross Pollard, 49, pioneer Texas oil field worker, died June 2 at Olney, Tex.

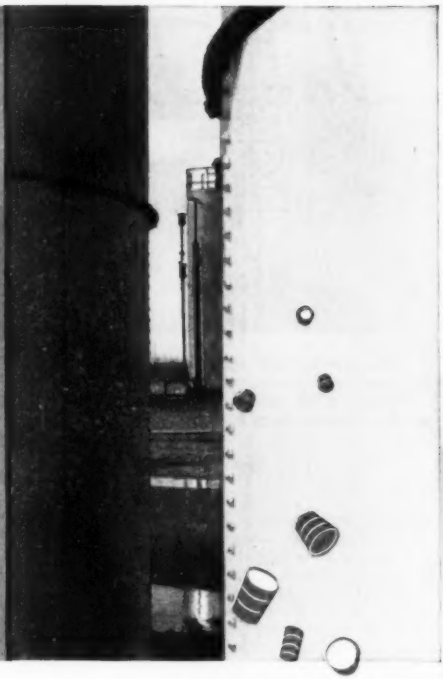
William F. Dodson, 54, Dallas, independent oil operator, died June 3.

Ira F. Scott, 55, president of Scott Drilling, Inc., died in Reed City, Mich., May 31.

James T. Norris, 68, veteran Michigan oil operator, died in Pittsburgh May 29.

John Thomas O'Reilly, 80, Tulsa drilling contractor, died May 31.

Visco SELLS MORE *Emulsion-Breaker* BY SELLING LESS!



● Treating cost per barrel of *acceptable* dry oil is the true measure of emulsion-breaker efficiency . . . And the Visco formula that requires the least chemical to do the best job is the one for your lease. Visco's service records show that we can sell *more* emulsion-breaking and dehydrating chemicals by selling *less!* Visco's sales records prove it.

Proof is as close as the nearest phone. Call Houston, CAPITOL 7300, collect, for service that matches Visco's fast, efficient emulsion-breaking.

VISCO PRODUCTS COMPANY
INCORPORATED
City National Bank Building
Houston 2, Texas

A NEW VISCO PRODUCT!

***Visco* VS SOLVENT**

Visco VS was developed for our own use as a high-flash-point solvent for wax, grease, lube oils, paint, oil-treating chemicals, and fusible or soft resins. It is so good, it has been made available to the whole petroleum industry! Will not harm skin, wood or metal. Available now. Write or call for full details and prices.

***Visco*... CONSISTENTLY EFFICIENT DEHYDRATING AND DESALTING CHEMICALS**

NOTICE: Visco Products Company is prepared to manufacture and sell Visco Oil Treating compounds for use in the breaking and resolving of oil emulsions, and to grant licenses for such use, under the following Patents: [illegible] and pending applications. Visco Oil Treating compounds is authorized to use the same in the treating, breaking and resolving of oil emulsions in accordance with the above patents. The royalty for such use is included in the purchase price. Visco Products Company is authorized to and is willing to grant licenses on a royalty basis, to oil companies, and to others desirous to practice the patented methods and to use Visco Oil Treating compounds in connection therewith. Visco Products Company is also willing to sell Visco Oil Treating compounds to oil companies and others who have licenses under the above patents or portions of patents, or who are licensed to operate under applications for license which may be made to Visco Products Company, Houston, Texas.

In-Fill DRILLING

Portion of Caddo and Pine Island oil fields. The portion shown in particular has had heavy redevelopment (Sections 5 and 6, 20n-15w). Data courtesy Globe Map Co., 311 Milam St., Shreveport, La.

This article deals with well spacing, giving results for developing additional locations down to about 3 acres per well. More than 1,000 new wells recently have been completed by "in-fill drilling" in this northwestern Louisiana pool.

by D. H. Stormont

SEVEN hundred new oil producers in a year's time—that was the record for the Pine Island area of Caddo field in northwest Louisiana for 1948. On the surface this it not unduly important as quite a number of shallow oil fields have undergone such rapid development. But, when it is realized that Pine Island already had been producing oil for 32 years, this completion record assumes outstanding importance.

Discovered in 1917, the Pine Island area has undergone several drilling splurges as new pays or extensions were developed. The advent of acidization also caused a drilling flurry in the late 30's and early 40's. None, however, was as extensive as the current campaign during which more than 1,000 new oil wells have been completed in the 1,500-ft. Annona chalk pay.

To some extent the Annona chalk development may be classed as a "sleeper," for the pay has been known to exist for more than 30 years. Even during the early development of the 2,300-ft. so-called "Woodbine" sand a few large chalk producers were completed—some with initial productions of more than 7,000 bbl. daily. Unless the wells blew in while drilling the chalk section, however, the pay was passed up in favor of the deeper, more prolific sand pays. Thus it was not until these deeper pays were practically exhausted, and the technique of treating with acid introduced, that the chalk pay was given much consideration.

In the Oil City townsite several hundred producers have been drilled as a result of the recent chalk development. Many lots contain two producers such as have been drilled here

Change in Completion Technique

The recent drilling flurry was touched off primarily by two developments: First, increases in the price of crude oil which caused operators to look for new oil production; and second, a change in completion tech-

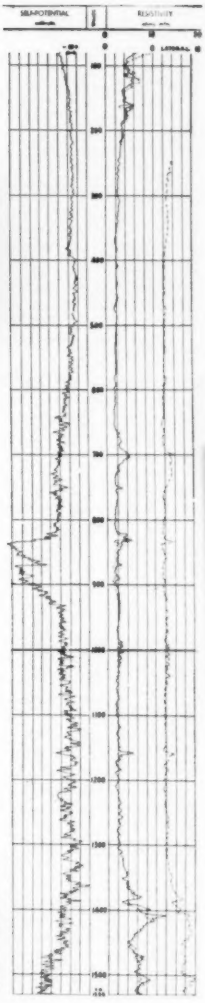
Some idea of the density to which the field has been drilled can be gained from this photograph of Caddo Levee Board lease. Because this portion of the field is subject to high water, causeways had to be built to each location

nique. The first, of course, needs no explanation; the high-gravity crude produced by these shallow wells is very desirable. Insofar as the method of completion is concerned, the practice formerly was to set pipe on top of the chalky pay and leave the entire zone exposed when acidizing. This generally resulted in bulk of acid load entering the more permeable upper section, which contains less oil than the two lower pays. Early in 1947, therefore, one operator set pipe through the two upper pays, acidized the lower pay, and then selectively perforated and acidized the two upper pays. Application of this technique resulted in oil wells of considerably higher initial production, as well as increased daily production in settled stages.

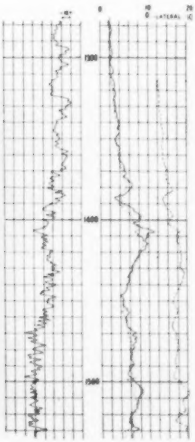
As a result of the higher oil productivity gained by this completion practice, drilling to the chalk rock was stepped up throughout the latter half of 1947 and most of 1948. Peak activity was during May to October of last year when an average of about 80 wells were completed monthly. Drilling since then has declined, averaging 45 new wells monthly during last March and April, but it is expected that the tempo may again pick up.

Activity undoubtedly will increase if the new Hydrafrac method of completion proves feasible in the chalk panys.[1] In many Pine Island wells highly fractured conditions are encountered in the chalk. Some relatively recent wells had initial productions of over 1,000 bbl. daily for the first few days. In the majority of wells, however, fracturing is believed to be practically nonexistent. Thus if the Hydrafrac method proves capable of substantially increasing daily oil production through opening new fractures and extending those in existence, it will be of great benefit in this very tight reservoir. Two jobs have been completed to date, both more or less unsuccessfully. As will be discussed at the conclusion, however, it is thought the work was not fully representative of the increased oil production which may be gained from use of the process.

Before discussing current activity further, data as to the field's early development and production performance will be dealt with briefly. First oil production in Pine Island proper was found in 1917 when Elton Oil Co. completed its 1 Hobbs in the "Woodbine" or Tokio sand at about 2,300 ft.[2] After these 2,200 to 2,400-ft. wells began to show signs of exhaustion, many were drilled deeper with the result that oil production was found in the Rodessa member of the lower Glen Rose at 2,800-2,900 ft. Still deeper pays later were developed but none was nearly as profitable as the shallower "Woodbine" producers. Current drilling is largely to the chalk rock, but some wells are being completed in the Blossom sand



Right: Electric log of Transgulf Corp. 12 Pardue-Weaver, Sec. 33, 21n-15w. Electrode spacing, AM = 16 in., AM' = 63 in., OA = 24 ft.; mud resistivity, 5.6 ohms at 72° F. The Nacatoch sand is present 820-930 ft.; Saratoga and Marlbrook series at 930-1,360 ft., and the Annona chalk below 1,360 ft. Below: Townsite well.—Typical electric-motor driven pumping equipment, equipped with automatic time switches, as used at Pine Island



at 1,800-1,900 ft. and in the deeper pays.

Production figures for individual pays and fields in the area are not available, as is the case in nearly all of our older fields. Fletcher, however, reported that by 1928 a total of 11,548,000 bbl. of oil had been produced by all the fields in the Pine Island-Caddo area, of which all but a small percentage had been produced from the "Woodbine" zone.[1] (The fields included were Caddo, Hosston, Mooringsport, Pine Island, and Vivian). As mentioned earlier, wells were completed in the chalk only if they came in as gushers so that production from this pay was relatively unimportant at that time.

By the end of 1936 the area's cumulative production was 139,574,000 bbl. and annual output was down to 2,381,000 bbl. from a peak of 11,143,000 bbl. in 1918. But by this time, bulk of the oil production was from the Annona chalk. Acidization had been introduced to the oil industry and was having its effect on drilling activity at Pine Island. This development reached its peak in 1940 when 233 oil producers were completed in the chalk. At the end of 1941 the field contained 1,629 oil producers, its cumulative yield was 152,807,000 bbl., and its production for that year totaled 3,095,600 bbl.

During the period 1942 through 1946 only a desultory drilling campaign was conducted so that at the first of 1947 the number of oil producers was down to 1,693, of which 1,511 were producing from the Annona chalk. Annual production for 1946 was only 1,912,900 bbl.

Chalk-Pay Interest Revived

Beginning in mid-1947, for the reasons mentioned earlier, interest was revived in this Annona chalk pay. A total of 254 wells were completed that year, in 1948 about 707 new oil producers were added, and during the first quarter of this year an additional 130 wells were drilled. Practically all of these producers were completed in the 1,450-1,650-ft. chalk pay. Current production is about 11,500 bbl. daily, of which it is estimated that 97 per cent is coming from the chalk, as compared with 7,700 bbl. in March 1948 and 5,350 bbl. daily in March of the previous year. Cumulative production at the first of the year was 169,506,000 bbl.

While much of the recent drilling was on leases where the chalk had not been developed, most of the activity consisted of drilling to a greater well density on tracts from which chalk crude was already being produced. Several hundred new wells were drilled in the Oil City townsite, as many as three wells being drilled on a single lot. Magnolia Petroleum Co., the largest operator in the field, completed 164 oil producers in drilling three of its leases to a well density of about 3.5 acres. Monthly pipeline runs from these leases, which now have 253 wells, in the past year have increased from 13,000 to 59,000 bbl. Davis & Hart, largest independent operator, drilled 87 wells in developing two of its leases. Pipe-line runs from these two leases totaled 12,600 bbl. in March.

Despite the reservoir already having been exploited for more than 30 years, flowing initial productions of well over 1,000 bbl. per day were reported in several instances. These occurred, it is thought, when the wells struck fractures or fissures which had not yet been produced. On the other hand, a great number of producers of small capacity, and a few dry holes, were drilled when the wells were completed in or near fractures from which the oil already had been produced by old wells. Average initial production for recent wells is in the vicinity of 50 bbl. daily, pumping.

Has 90-Ft. Oil Section

Because of the very tight nature of the chalk pay—"varying up to 1 md.," as one engineer described it—drainage is not believed to have been appreciable except where minor faults or fractures were involved. Concensus of engineers and operators is that the chalk, which averages about 250 ft. in thickness and has a net oil section of about 90 ft., contains an oil reserve of about 100,000 bbl. per acre. Porosity varies from about 20 to 25 per cent. Because of the very low permeability and reservoir pressures, flow of oil from the reservoir to the well bore is slow.

As a result of the tight pay condition, rapid decline in oil production takes place. As a general rule these chalk wells settle to a daily production of 4 to 10 bbl., regardless of how high the initial production was, within a few months. In some wells this settled pumping level is not reached until about a year. Past performance of chalk-rock producers, however, has shown that once they reach settled production they will produce at about the same rate for many years. Some completed in the early 30's, and a few older, are reported to be still pumping a few barrels of oil daily. At its old Dixie Hill lease northeast of Pine Island, Stanolind Oil & Gas Co. has been producing about 15,000 bbl. monthly from some 150 wells for several years.

The 150-ft. chalk section is divided into three pay zones by two shale breaks, the upper pay being the thicker of the three. The two lower zones, from which most of the oil is being produced, have a combined net oil section of about 60 ft. The upper pay is encountered about 100 ft. below the top of the chalk, as is shown in the accompanying type log. The pays have but little horizontal or vertical communication except in the vicinity of fractures and fissures.

In this connection, several peculiar incidents have been noted when wells were given their usual 3,000 to 5,000-gal. acid treatment upon completion, or when being reacidized. Because of this fractured condition acidization showed little or no effect on the productivity of the well being treated, but a well on the next location would suddenly show a jump in oil production. In some instances offset wells would even start flowing. In one outstanding case reported, a dead well about 250 ft. distant from the one being treated started pumping 35 bbl. daily. Several operators commented that these occurrences took place in wells to the northeast or southwest of the well being treated, indicating the major fractures were along a northeast-southwest trend.

All drilling is being done with light rotaries, with only about 5 days being required for each well. Hole sizes and casing programs vary among the operators, but generally from 50 to 100 ft. of 7 or 8⅝-in. surface casing is set. Hole is then carried to the base of the lower chalk pay and 4, 4½, or 5½-in. oil string is set through the two upper pays, leaving the lower pay exposed. Some operators then acidize only the lower pay, with 3,000 to 5,000 gal. in one treatment, and then perforate the two upper pays. Others perforate the two upper pays and selectively acidize all three zones. Shot densities of four per foot of hole are used by some operators. Total cost of completing these wells, including tankage and flow line, varies from around $8,500 to $12,000 per well.

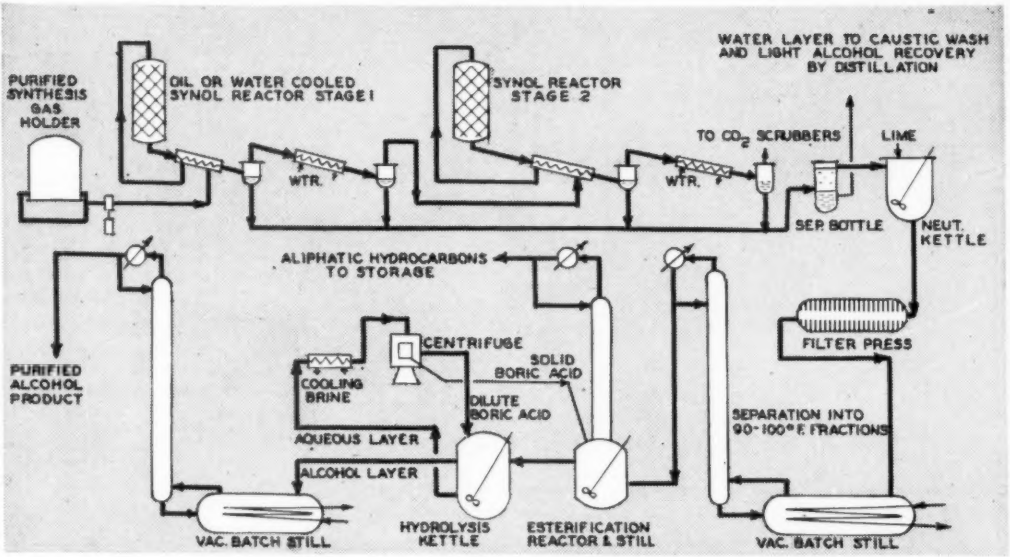
Ultimate Yields Higher

Because of the improved productivity made possible by acid treatment, it is expected that the ultimate per-well yield will generally be in the order of 25,000 to 30,000 bbl. for the wider-spaced wells. Some of the better wells have paid out in less than a month, but on the average the payout will be from 2½ to 3 years. Gravity of this chalk rock crude varies from about 38° to 42° A.P.I.

Practically all pumping is done with 3-hp. motors, using purchased electric power. The wells pump off in 4 to 12 hours so that most wells are equipped with automatic time clocks. Pumping costs vary widely from company to company, depending upon size and upon number of wells operated. One operator, however, stated his costs for power and lease help were only $35 per well. Greatest operating difficulty is caused by paraffin, accumulations of which require that the wells be cleaned once or twice annually, or that paraffin solvents be used periodically.

From the above per-well recovery figures it is evident that a relatively low yield will be obtained from the chalk pays. Stanolind has attempted to repressure a tract at its Dixie Hill holdings but the project was not successful. Water-flooding is thought to be impractical because of the shallow

(Continued on page 82)



Schematic flow arrangement of the Synol process

PRIMARY LONG-CHAIN Alcohols—A NEW PETROCHEMICAL

by Peter W. Sherwood

ETHANOL, isopropanol, and other low-molecular-weight alcohols have long been a mainstay of the petrochemical industry. They are readily synthesized by the hydration of the corresponding olefins. The reaction may be carried out directly in the vapor phase, e.g., in the presence of an alumina catalyst. The method which is today most commonly employed, however, involves the sulfonation of the olefin followed by hydration:

$$R{-}CH = CH_2 + H_2SO_4 \downarrow$$

$$RCH{-}CH_3 \xrightarrow{H_2O} R{-}CH{-}CH_3 \quad (1)$$
$$\quad\quad OSO_3H \quad\quad\quad\quad OH$$

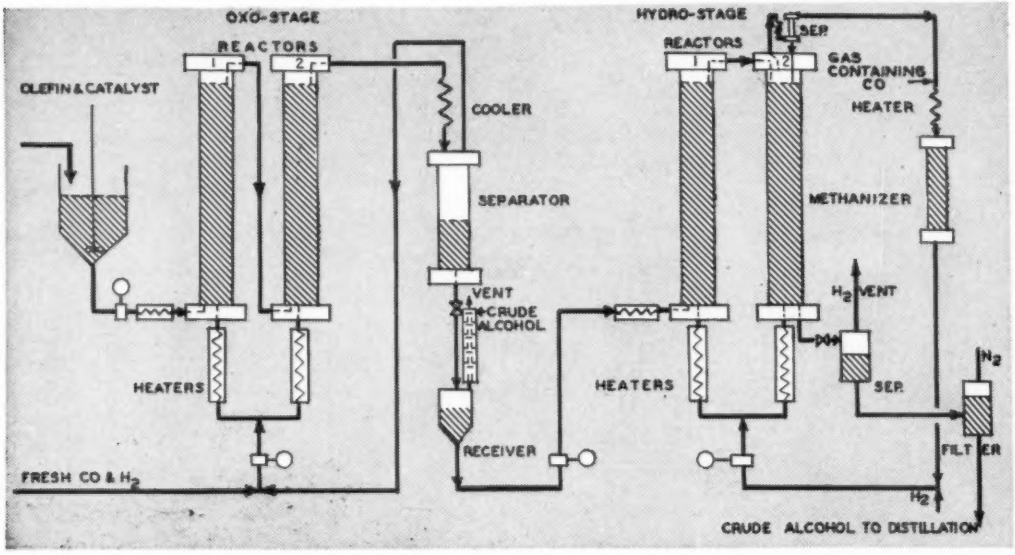
The controlling step in this synthesis is the first reaction, the sulfonation of the olefin. It is found that it proceeds with ethylene only in the presence of concentrated sulfuric acid while propylene and butylene undergo this reaction with greater ease. In fact, one method for the removal of higher olefins from ethylene is based on this very property; the olefinic mixture is passed through 85 per cent sulfuric acid in which the higher olefins are absorbed while ethylene passes through the solution essentially unchanged.

One of the most striking characteristics of the hydration of olefins is the fact that the product consists almost solely of secondary or tertiary alcohols—except in the case of ethanol where none but the primary alcohol is possible. Thus, the hydration of propylene results almost exclusively in the production of isopropyl alcohol, while butylene is converted to isomeric butanols, other than n-butanol.

Another limiting aspect of the synthesis by hydration is the unsuitability of the reaction for olefins having eight or more carbon atoms. Hexanol and heptanol may be produced from the corresponding olefins with comparative ease. When, however, octene is treated with aqueous sulfuric acid, polymerization takes place rapidly enough to defeat the

Established hydration methods for the production of alcohols from olefins are not suitable for the synthesis of primary long-chain alcohols. Two processes for the preferential production of this line of chemicals are now available to the petrochemical industry—the Synol and the Oxo reactions. The Synol process for the production of the entire homologous series of straight-chain primary alcohols has not so far attained industrial significance. The Oxo process for the synthesis of isomeric alcohols of high molecular weight is now practiced in one American plant and is attracting considerable interest throughout the industry. The present paper discusses the need for these methods of synthesis, technical operating details, and the nature of the products obtained by these novel processes.

The author is with the Koppers Co., Pittsburgh.



Simplified flow diagram of the Oxo process (continuous slurry operation)

hydration process. Octanol yields are as low as 15 per cent of theory.[3]

This limitation does not totally defeat the usefulness of the hydration reaction for the synthesis of secondary and tertiary alcohols from olefins of high molecular weight. The approach to the synthesis must, however, be carried out in an indirect fashion. In one attractive process,[3,4] the olefin is introduced into a mixture of sulfuric and acetic acids. The product is found to be predominantly the acetic ester of the expected secondary alcohol which can be readily isolated and hydrolized. In this process, the rate of polymerization is greatly outdistanced by the rate of ester formation.

Hydration of olefins has attained industrial significance only for the production of some of the lower alcohols. Synthetic ethanol, isopropanol, and sec-butanol are today common articles of commerce, and secondary amyl alcohols are also readily available. No instance of industrial application of indirect hydration methods to the synthesis of the higher secondary alcohols has become known—at present they are only potential tools for the petrochemical industry.

Synthesis of Primary Alcohols

As a basis for the production of primary alcohols, the hydration of olefins is totally unsuited. Two new processes—the Oxo and the Synol synthesis—have been developed during the past few years to fill this gap in the array of petrochemical products. In November 1948 the synthesis of primary long-chain alcohols by the Oxo process achieved commercial realization in the United States at the Baton Rouge plant of Esso Standard Oil Co.

The present scope of operations at Baton Rouge is reported to be confined to the production of isooctyl alcohols.[4] As will be seen below, there is, however, no limit to the number of alcohols which can be produced by the very versatile Oxo process.

Immediately on the heels of the initiation of Oxo activities at Baton Rouge followed an announcement that the Oxo process is being employed at the Bridesburg, Pa., pilot plant of Rohm & Haas Co. for the manufacture of nonanoic acid, nonylamine, nonyl aldehyde cyanohydrin, α-hydroxydecanoic acid, octadecenyl aldehyde, and octadecyl alcohol. Raw material for this production is diisobutylene.[5] Other companies which show an active interest in the commercial possibilities of the Oxo process include Shell Chemical Co., Oronite Chemical Co., The Texas Co., and E. I. du Pont de Nemours & Co.

So far, the Synol process has not been considered industrially attractive and there is no indication that it will be the basis for alcohol production in the near future. It offers, however, a product which differs appreciably from the alcohols derived from olefins by the Oxo process. Thus, the Synol and Oxo processes are complementary rather than competitive and the extent of their expansion will depend on future market developments.

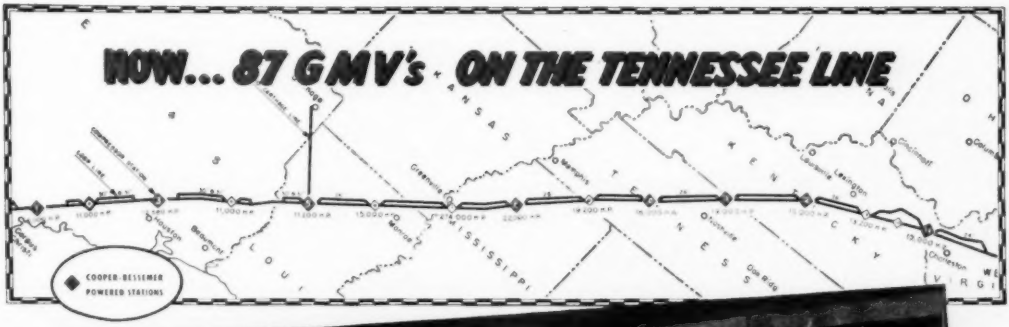
The Synol Process

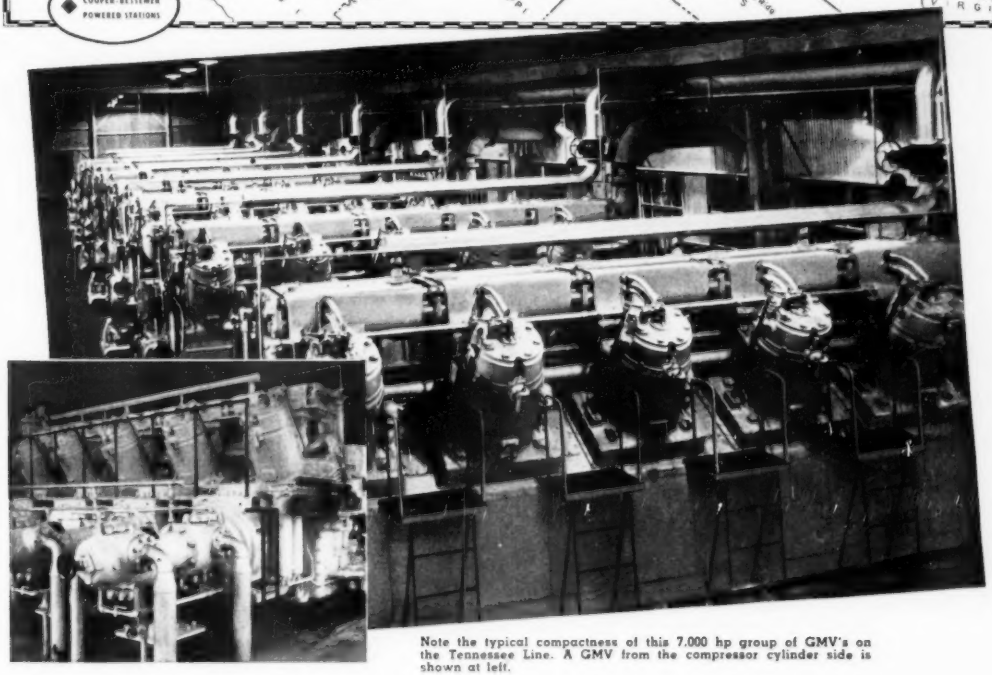
Early in the development of the Fischer-Tropsch process it was noted that synthesis over an iron catalyst resulted in the production of appreciable quantities of oxygenated chemicals. It was found that the proportion of these materials tended to increase as the operating pressure was raised.[6]

While the synthesis of large amounts of oxygenated chemicals must be looked upon as a disadvantage where the desired product is a mixture of hydrocarbons for fuel purposes, I. G. Farbenindustrie was able to turn this drawback of the process into a virtue by the development of a process capable of producing predominantly straight-chain primary alcohols which could be recovered for their chemical value. This development was in accordance with the view which this firm had held from the very inception of the Fischer-Tropsch process; namely, that its principal value lay in the production of oxygenated chemicals rather than in the synthesis of fuels.

The Synol process of I. G. Farbenindustrie uses for its raw material a synthesis gas containing a carbon monoxide-to-hydrogen ratio of 1:0.7. The reaction is carried out at a pressure of about 300 psi., and a temperature of 380°-400° F. A sintered-iron catalyst is employed, of the type employed for nitrogen fixation and for some versions of the Fischer-Tropsch hydrocarbon synthesis (e.g., the Duftschmid liquid-phase process). This catalyst is preferred over precipitated Fischer-Tropsch iron catalysts for reasons of more readily controlled production and greater physical strength. The chemical nature of the reaction product is determined to a

NOW... 87 GMV's ON THE TENNESSEE LINE





Note the typical compactness of this 7,000 hp group of GMV's on the Tennessee Line. A GMV from the compressor cylinder side is shown at left.

The story of the Tennessee Gas Transmission Company's big line is one of continuous growth from its beginning in 1944. Present capacity is 600 million cubic feet of gas a day. This year further expansion will add another 60 million cubic feet daily.

The line's engine-driven compressors now total 215,400 hp. Well over half, 119,000 hp, is furnished by Cooper-Bessemer units. Of these, 87 are modern 1000 hp V-angles . . . GMV's. Still more GMV's are to be added during the year.

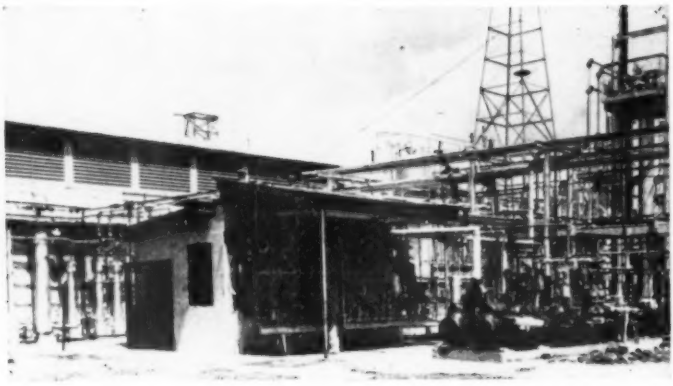
On this and other lines GMV performance has proved a point of major importance to compressor users . . . that despite money-saving compactness, GMV's are truly rugged units, with exceptional resistance to wear and freedom from trouble. It adds up to compressor service at the lowest of low cost.

You'll be money ahead if your plans call for Cooper-Bessemer V-angles. They are built in three types from 200 to 2400 bhp.

The
Cooper-Bessemer
Corporation

MOUNT VERNON, OHIO — GROVE CITY, PENNA.

New York City Washington, D. C. Bradford, Pa. Parkersburg, W. Va. San Francisco, Calif. Houston, Dallas, Greggton, Pampa and Odessa, Texas Seattle, Wash. Tulsa, Okla. Shreveport, La. St. Louis, Mo. Los Angeles, Calif. Caracas, Venezuela Gloucester, Mass. Calmes Engineering Co., New Orleans, La.



High-pressure pumps and lines in the Oxo plant of Esso Standard Oil Co.

certain extent by the method of catalyst preparation, but does not appear to be a determining factor in the selection of the sintered catalyst.

The reaction mechanism underlying the Synol synthesis is not clearly understood, but is thought to be akin to the Fischer-Tropsch mechanism. The reaction shares many of the characteristics and problems of the Fischer-Tropsch synthesis. Here, too, one of the major engineering problems is the efficient removal of heat from the reaction zone. The presence of sulfur in the raw gas is highly deleterious to the activity of the catalyst and must be reduced to the limits generally accepted for the operation of Fischer-Tropsch units (0.1 grain per 100 cu. ft.).

The effect of process variables on the product of the Synol reaction has been reported by Reichl.[7] For maximum production of primary alcohols, it is desirable to control the reaction temperature at the lowest feasible level—usually 375°-385° F. Operation at higher temperatures result in the formation of a greater amount of hydrocarbons at the expense of oxygenated products. The presence of inert gases, and especially of carbon dioxide, in the reaction products affects the activity of the catalyst adversely and the operating temperature must be raised, with a resultant drop in the yield of alcohols. The normal operating pressure is in the range of 300-400 psi. A further increase in pressure tends to promote the deactivation of the catalyst by carbon deposition and by the formation of volatile iron carbonyl.

The accumulation of reaction products in the gas stream tends to minimize the useful conversion of the feed gas and their periodic removal from the reaction phase is essential for maximum exploitation of the raw material. One solution to this problem involves the operation in several successive stages after each of which the reaction products, and above all the water formed during the reaction, are removed from the synthesis gas. In this way the further dehydration and hydrogenation of the organic product is avoided while the removal of water from the reaction zone minimizes the further formation of carbon dioxide (by the water gas shift reaction with carbon monoxide) in the following reaction stage. The removal of carbon dioxide is also desirable from a chemical point of view, but is not recommended because valuable alcohols are certain to be lost in the course of the scrubbing process.

As an alternative to multistage operation, it is possible to mix the cleaned product gas with the fresh feed to the reactor, i.e., to carry out a recycling operation. In order to prevent a buildup of inert material, it is necessary to bleed off a portion of the product gas.

The extent to which the synthesis gas is usefully exploited depends largely on economic considerations. It is obviously possible to increase the yield progressively by increasing the number of reaction stages or by raising the ratio of recycle-to-feed gas. For industrial purposes, the maximum utilization of synthesis gas is in effect limited to 90-95 per cent of the carbon monoxide plus hydrogen content. Under suitable operating conditions approximately 9.5 lb. of liquid product and some 3 lb. of liquefied petroleum gases are produced per 1,000 cu. ft. of carbon monoxide plus hydrogen.

The liquid product is a complex mixture of oxygenated chemicals and hydrocarbons. By far the greatest portion of the oxygenated products consists of straight-chain primary alcohols—products which can today be produced commercially only by the Synol and Oxo processes. Together with the alcohols, various esters are found among the oxygenated chemicals. Up to C_{10} these esters make up only about 10 per cent of the total oxygenated products but this percentage increases among the compounds of higher molecular weight. Smaller amounts of aldehydes and ketones are also found in the product. Acids and other oxygenated compounds are present in the product to an extent of less than 1 per cent. Their chief significance is a nuisance problem which they introduce during purification.

The composition of the liquid product varies considerably with the operating conditions and the catalyst composition. A representative product from the Synol synthesis may be expected to have approximately the following composition:[8]

	Per cent
Oxygenated chemicals	35-50
Olefins	25-40
Paraffins	20-35

The separation of the alcohols from the hydrocarbons contained in the Synol product is carried out most efficiently by a method involving the intermediate formation of their boric acid esters. The crude product is first neutralized and is then distilled into several fractions of 90°-100° F. boiling range. The esterification is carried out by adding solid boric acid to the crude fraction and heating the mixture to 200°-220° F. Water which is formed as a byproduct of the esterification is removed overhead. The complete removal of the water is essential to efficient esterifications.

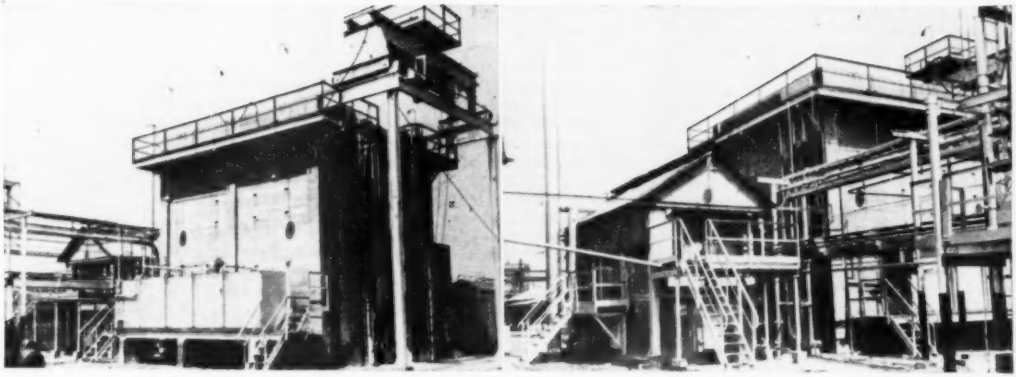
The boric acid esters are found to have a boiling point considerably above that of the treated fraction, and separation by distillation is comparatively easy:

Boiling range of charge	Boiling range of esters
160°-220° C.	280°-340° C.
270°-274° C.	490°-494° C.

Care must be taken that the bottoms temperature does not exceed 300° C. to avoid thermal decomposition of the ester. Distillation of the higher fractions must be carried out under vacuum.

The separated ester is hydrolized at 200°-220° F. in the presence of recycle dilute boric acid solution. The hot mixture separates into two layers. The alcohol layer is water washed and redistilled. The lower layer is an aqueous solution of boric acid. This layer is cooled to 40° F. and the boric acid crystals are filtered off for reuse in the esterification. The filtrate is returned to the hydrolysis stage.

The most striking characteristic of the Synol product is the almost complete absence of secondary or branched-chain alcohols. It is therefore possible to recover straight-chain primary alcohols in the state of considerable purity by fractionation of the product of the boric acid treatment. The limit to the production of pure alcohols is set by the drastic conditions of temperature required for the distillation of the higher alcohols, which would bring about de-



Left: The Oxo reaction is carried out in the high-pressure stall. Right: Rear view of the Oxo stall showing the preheater furnace

composition of the product. Up to C_{10}-C_{11} alcohols the Synol process represents a novel and unique tool for the production of pure straight-chain primary alcohols.

For a great many purposes the isolation of individual alcohols is quite unnecessary and the mixture of homologous alcohols which is rendered in a state of good purity by the boric acid treatment of the Synol product represents a satisfactory working material.

The Oxo Process

Synthesis of primary alcohols by the Synol process is completely nonselective. It is not possible to produce any particular desired alcohol without obtaining at the same time the entire gamut of alcohols from ethanol to its homologs of very high molecular weight as well as a large output of hydrocarbons. By changing the composition of the catalyst and the exact operating conditions, it becomes possible to favor certain alcohol fractions within small limits. But the yield of any particular alcohol is certain to be small and is not likely to account for more than 5 per cent of the synthesis gas utilized in the reaction.

It is perhaps because of its unsuitability for directed alcohol production that the Synol process has never matured into industrial utilization. Instead, commercial production of primary long-chain alcohols has had to be based on the Oxo process, another relative of the Fischer-Tropsch synthesis.

The Oxo reaction is a comparative newcomer to the industry. The first suggestion of this reaction was published by Smith, Hawk, and Golden[9] in 1930. These authors noted the formation of large amounts of oxygenated compounds when ethylene, carbon monoxide, and hydrogen were passed simultaneously over a cobalt catalyst at elevated temperature and pressure.

It was, however, not until 1939 that a thorough study was made of the nature of these products by O. Roelen and associates. U.S. 2327066,[10] issued in 1943, is probably the first public announcement of the Oxo reaction for the synthesis of alcohols and aldehydes from olefins and water gas.

$$R{-}CH{=}CH_2 + H_2 + CO \downarrow \rightarrow RCH_2{-}CH_2{-}CHO \text{ or } R{-}CH(CHO){-}CH_3 \quad (2)$$

The Oxo reaction is remarkably versatile and takes place readily with a host of olefinic and acetylenic compounds. In the laboratory, olefins ranging from ethylene to diisobutylene and from cyclohexene to pinene have been successfully subjected to the Oxo reaction, usually with yields in excess of 90 per cent.

The Oxo reaction is thus ideally suited for the manufacture of a wide range of primary monoalcohols and a more limited range of aldehydes. Where the alcohol is the desired final product, the reaction is carried out in two successive stages: (1) Oxoation followed by (2) hydrogenation of the aldehydic product.

These are certain limitations to the scope of the Oxo process. It is, for instance, not possible to effect the reaction with aromatic compounds, while the oxoation of dienes takes place with only very unsatisfactory yields of the expected dialdehydes. In the latter case, it is found that the principal product is the monoaldehyde, indicating that only one of the olefinic double bonds is susceptible to the reaction.

Propionaldehyde and n-propanol initiate the series of compounds which can be manufactured by the Oxo process. The process for the manufacture of propionaldehyde has been worked out by Ruhrchemie, A. G., for a commercial project planned by the Italian firm, Bombrini-Parodi-Delfino, during the last years of the second World War. Because of military developments, the propionaldehyde plant was never actually erected but process details have become available.[11] The original intention was to employ the product for the manufacture of trimethylol ethane, a substitute for glycerol in some of its applications.

Use of the Oxo reaction for the production of n-propanol from ethylene is technically feasible but the economic soundness of this mode of synthesis has not been fully established for United States conditions. Similarly, the production of butyraldehyde and n-butanol must meet the competition of the established synthesis from acetaldehyde via crotonaldehyde:

$$2CH_3{-}CHO \rightarrow CH_3{-}CH{=}CH{-}CHO \downarrow H_2 \rightarrow CH_3{-}CH_2{-}CH_2{-}CHOH \quad (3)$$

The chief attraction of the Oxo process is found in the synthesis of alcohols and aldehydes of higher molecular weights. The classical methods for synthesizing these compounds involve a number of successive condensations of aldehyde building blocks, with appreciable losses in each stage. The production of the higher alcohols by such classical methods is therefore economically unsound. It is in the synthesis of these compounds that the Oxo reaction finds its most fertile grounds.

Complexities of the Oxo Product

Where the desired product is one particular alcohol rather than a mixture, it is necessary to employ a highly purified olefin as starting material. However, even when pure olefins are provided as raw material, the Oxo reaction leads to a mixture of isomeric aldehydes and primary alcohols. Reaction 2 shows that the primary product of the reaction is a mixture of

alpha-methyl and terminal aldehydes. The distribution of these isomeric compounds is dictated by the steric hindrance encountered in the molecule. The degree of branching averages 60 per cent if end chain olefins are employed.

In addition to the predominant primary products, isomeric compounds are found whose alpha side chain may be an alkyl group other than methyl. The appearance of these compounds is explained by the very pronounced isomerizing effect which the catalyst for the Oxo reaction—cobalt carbonyl—exerts on the double bond of long-chain olefins:

$$R{-}CH_2{-}CH_2{-}CH{=}CH_2$$

$$\downarrow$$

$$R{-}CH_2{-}CH{=}CH{-}CH_3$$

$$\xrightarrow{\text{Oxo}}$$

$$RCH_2{-}\underset{\displaystyle CHO}{\underset{|}{CH}}{-}CH_2{-}CH_3 \qquad (4)$$

and

$$RCH_2{-}CH_2{-}\underset{\displaystyle CHO}{\underset{|}{CH}}{-}CH_3$$

The isomerization and the Oxo reaction take place simultaneously. Apparently, however, the Oxo reaction takes place at a much greater rate and the amount of these secondary products is fairly limited.

A number of side reactions take place during the Oxo stage to form esters (by the Cannizzaro reaction), ketones (by the condensation of two molecules) and polymerization products. By proper selection of the operating conditions, the formation of these byproducts can be minimized, however, and a yield of primary alcohols amounting to 70-90 per cent of theory may be realized upon hydrogenation of the Oxo product.

Operating Conditions for the Oxo Process

The Oxo process for the production of primary alcohols consists of two distinct steps: The Oxo stage and the hydrogenation stage.

The Oxo stage is carried out universally in the liquid phase to minimize the occurrence of side reactions. Operation with gaseous olefins calls for the use of an auxiliary solvent. For instance, the synthesis of propionaldehyde from ethylene can be carried out in the presence of either toluene or water with excellent yields.

While it is found that the reaction takes place at atmospheric pressure, the rate of reaction and the yields are quite unsatisfactory under such conditions. Efficient operation of the Oxo reaction calls for the use of elevated pressures, preferably about 3,000 psi.

The maintenance of accurate temperature control is not as critical as it is in the related Fischer-Tropsch process. The usual operating range is between 240° and 375° F. The exact temperature selected for operation depends on the nature of the feed stock and the activity of the catalyst and must be determined experimentally. In order to retain control over the exothermic reaction, it is, however, necessary to provide cooling.

Cobalt catalyst is universally employed for the Oxo reaction. The use of iron catalysts has been reported with positive results[12] but yields were not satisfactory. Of the three German plants which actively pursued research on the Oxo process, two (Ruhrchemie and Leuna) employed the standard cobalt Fischer-Tropsch catalyst, while the third (Ludwigshafen) favored operation over pumice carrying metallic cobalt. In either case, the active catalytic principle is cobalt carbonyl.

The Ruhrchemie Oxo operation was carried out on a strictly batch basis. Leuna, on the other hand, was able to develop a continuous process in which the catalyst was provided in the form of a slurry. This process showed good space velocities and was deemed to be the most promising approach to the industrial exploitation of the Oxo process.

Operation at Ludwigshafen took place over a fixed-bed catalyst. Because some cobalt is continuously removed in the form of its volatile carbonyl, it is necessary to replace it by the addition of cobalt to the feed. At Ludwigshafen, this requirement was met by the addition of the cobalt salt of a fatty acid to the olefinic feed stock.

The Ludwigshafen fixed-bed process had certain operational advantages but gave only a comparatively low space-time yield. It was therefore not competitively successful.

The water gas employed for the Oxo reaction is generally composed of equal volumes of carbon monoxide and hydrogen, i.e., theoretical proportions. Small amounts of sulfur do not decrease the activity of the cobalt catalyst in the Oxo reaction. Where the process is to be employed for the manufacture of alcohols, it is, however, necessary to exclude sulfur compounds rigorously from the reaction to avoid their access to the hydrogenation catalyst which is very susceptible to sulfur poisoning.

Hydrogenation of Oxo Aldehydes

In the absence of sulfur compounds up to 40 per cent of the primary aldehydes are hydrogenated to the corresponding alcohols in the Oxo stage.[13] The remainder of the Oxo aldehydes can be converted to alcohols in a separate hydrogenation stage. The process can be carried out in the presence of a number of standard hydrogenation catalysts. At Leuna, the Fischer-Tropsch cobalt catalyst from the Oxo reaction was employed during the hydrogenation stage. Pressure and temperature conditions are practically identical with those maintained in the primary stage.

The presence of carbon monoxide obstructs the hydrogenating ability of the catalyst. It becomes therefore necessary to release the pressure between stages and to maintain a hydrogen atmosphere in the second stage. Some carbon monoxide will enter the hydrogenation stage nevertheless, either as dissolved gas or in the form of cobalt carbonyl. The problem is dealt with by the methanization of carbon monoxide in the recycle hydrogen stream of the second stage.

Ludwigshafen preferred the use of a fixed-bed catalyst consisting of copper chromite on silica gel[14] for the hydrogenation stage. This catalyst is less susceptible to carbon monoxide poisoning and shows excellent hydrogenating ability for Oxo aldehydes.

In the slurry process, the cobalt catalyst is separated from the product of the hydrogenation stage by filtration. The cobalt is recycled to the Oxo stage without further purification. It has been demonstrated that the catalyst can be reused 50-60 times before it must be discarded.[14]

This recovery procedure is not possible if cobalt catalyst is not used in the second stage, because cobalt, while insoluble in the hydrogenated product, is fairly soluble in the aldehydic primary Oxo product. The Ludwigshafen fixed-bed process requires therefore an intermediate step in which the primary product is contacted with hydrogen over a bed of pumice. As a result of this treatment, cobalt carbonyl is reduced and insoluble metallic cobalt is precipitated on the pumice from which it is periodically recovered.[15]

If a sufficiently pure olefinic feed stock has been employed, it is possible to purify the alcohols by simple fractional distillation. The alcohols produced by the oxoation of a feed of wide boiling range, on the other hand, cannot be separated from the attendant hydrocarbon oil by such direct methods. A favored method by which such separation can be effected consists of the formation of boric acid esters of the primary alcohols. The method has been described above in connection with the recovery of alcohols from the Synol products.

Uses for Primary Long-Chain Alcohols

Primary long-chain alcohols are a new commercial product. The full extent of their marketing possibilities cannot at the present time be visualized.

Major applications which are certain to present themselves for these products are their employment as plasticizers and detergents. The latter use promises a particularly wide field of application.

At the same time, these compounds

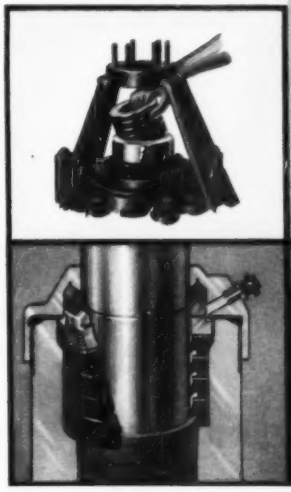
(Continued on page 82)

THE MOST Important Improvement IN SWIVEL DESIGN IN YEARS!

The washpipe and packing assembly always has been one of the most troublesome parts of a swivel. Complicated design, improper lubrication and extremely short service life have caused untold hours of rig down time. Emsco swivels incorporate a new cartridge washpipe packing. This exclusive Emsco feature eliminates all lubrication, installation and servicing problems. It is a one-piece assembly consisting of four lip-type seal rings, separated and supported by steel thrust spacers. The outer portion of each ring is made of heavy material. The steel thrust spacers take all of the fluid pressure load. All pressure imposed by the packing clamping nut is absorbed by the solid outer portion of the cartridge. The soft, flexible sealing lips are never deformed. Lubrication is positive. Friction reduced. Life of both packing and washpipe increased.

THE EMSCO CARTRIDGE WASHPIPE PACKING*

EASIER INSTALLATION
Cartridge washpipe packing can't be installed incorrectly. There is only one piece. It fits only one way. After long, severe service, packing can be easily renewed in a fraction of the time required for conventional style packings.



POSITIVE LUBRICATION—The soft, flexible sealing lips permit free passage of grease. Grease goes where it belongs. Lubrication is positive. The need for a wear bushing to protect sleeve is eliminated. Reduced friction increases life of washpipe and packing.

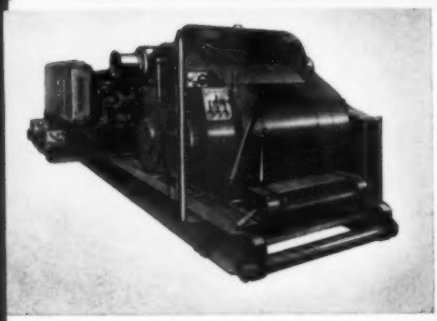
LONGER LIFE—Emsco cartridge washpipe packing has a unique "step-wear" action. When packing is new, lowest ring performs all sealing action. The mud presses lip firmly against washpipe. The higher the pressure, the more perfect the seal. Only outer extremity of sealing lip is subject to wear. As lip wears, next ring takes up sealing function. As this lip wears, it in turn passes sealing function to next lip. This "step-wear" action reduces friction between washpipe and packing and assures long, trouble-free service life.

Cartridge washpipe packing is just one of many outstanding features found in Emsco swivels. Ask your nearest Continental-Emsco representative for complete information. There is a size and type to meet all drilling requirements.

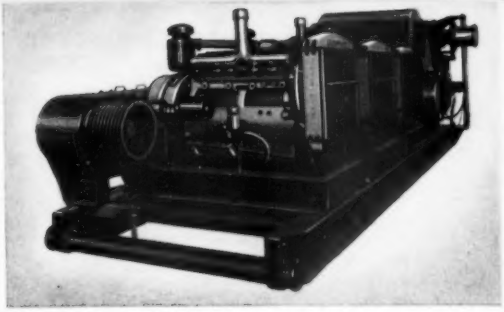
*Patent Pending.

CONTINENTAL

THE CONTINENTAL SUPPLY COMPANY
General Offices: DALLAS, TEXAS • Export Division: 30 Rockefeller Plaza, New York, N. Y. • Representatives: ARGENTINA • BOLIVIA • BRAZIL • CHILE • COLOMBIA ENGLAND • JAVA • MEXICO • PERU • TRINIDAD VENEZUELA



EMSCO GA-500 DRILLING RIG. A 500 hp rig designed for faster, safer and more economical drilling. May be equipped with or without sand reel. Available with 2 or 3 engine compounding transmission.



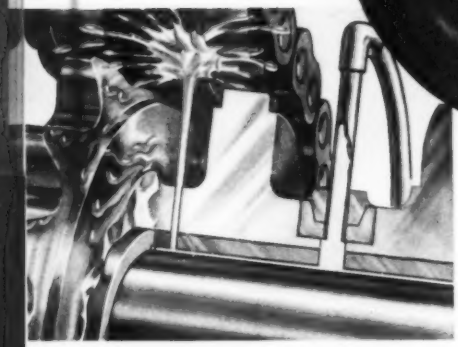
EMSCO GA-350 DRILLING RIG. A 350 hp rig. May be equipped with or without sand reel. Available with 2 or 3 engine compounding transmission. Push-button air controls are provided for operation of jaw clutches in selective speed transmission.

Pressure Lubricated Power!

EMSCO "GA" SERIES DRILLING RIGS

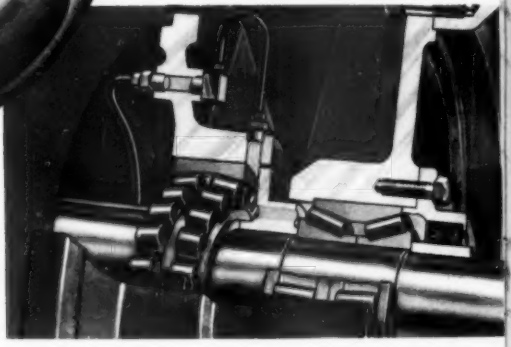
Completely Pressure Oil Lubricated from Pump Countershaft to Rotary Machine

Most drilling rigs utilize a grease system for lubricating shaft bearings and a splash system for oiling chain and sprockets. A few use both grease and oil for lubricating shaft bearings. But only Emsco "GA" Rigs have complete pressure oil lubrication of all bearings, chains and sprockets. Time normally used for lubricating the rig is converted to profitable drilling. Inefficient lubricating nipples and drip systems are eliminated. Wear is minimized; rig service time reduced; troublesome grease fittings eliminated. This force-feed oil system is just one of many features that make Emsco "GA" Rigs outstanding for medium depth drilling.



UNIQUE "OIL-SPRAY" SYSTEM.* All chains and sprockets are lubricated by a positive force-feed spray system. Oil flows through hollow hubs of sprockets into path of chains, thoroughly lubricating all working parts, reducing wear, assuring longer life.

*Patent Pending



PRESSURE OIL LUBRICATED BEARINGS. Two gear-type pumps force-feed oil-lubricate all bearings and chains. Each bearing has its own supply of clean, filtered oil. Grease fittings are eliminated. Oil flows through bearing assemblies. This flushing action keeps bearings clean and free from foreign matter.

EMSCO DERRICK & EQUIPMENT COMPANY
LOS ANGELES, CALIFORNIA
Houston, Texas • Dallas, Texas

EMSCO
REG. U.S. PAT. OFF.

Distributors
(Continued) THE CONTINENTAL SUPPLY COMPANY, Dallas, Texas
Export: THE CONTINENTAL SUPPLY COMPANY, INC., New York, N. Y.

Detection of Incipient Drill-Pipe Failures

by Walter C. Main

INTRODUCTORY

THIS article summarizes a presentation made at A.P.I. Pacific Coast meeting, division of production, Los Angeles, May 12-13. The author is with Technical Oil Tool Corp., Ltd., Los Angeles.

In the introduction to his paper, Author Walter C. Main pointed attention to the comprehensive survey of drill-pipe inspection methods made by Batelle Memorial Institute (Columbus, Ohio) for the American Association of Oilwell Drilling Contractors—and summarized the 10 different test methods for drill pipe as follows:

1. **Electric-current conduction tests.**—"Are not promising because scale and corrosion on the surfaces make it difficult to obtain adequate electrical contacts."

2. **Electro-magnetic induction tests.**—"Offer promise in drill-pipe testing. However, practical difficulties are encountered when applied, as drill pipe in general is larger than the tubes and bars now commonly being tested, and the defects are relatively very small in comparison with the total volume of metal."

3. **Magnetic field tests.**—"Several methods are very appropriate; magnetic tests similar to those now developed for rail testing also are worthy of consideration."

4. **Electric field tests.**—"None has been proposed for drill pipe"; the study indicates that they would not be promising.

5. **Thermal nondestructive tests.** "Too time consuming and the difficulties in detecting and interpreting results offer little promise."

6. **Penetrating radiation tests.**—"Offer limited although interesting possibilities."

7. **Mechanical vibration tests.**—"Several interesting possibilities, but their practical application may be limited by difficulties in coupling the source of vibrations, and the detectors, to the drill pipe"; the actual size of serious corrosion-fatigue cracks is often too small to act as good reflecting surfaces.

8. **Luminous energy tests (optical viewing).**—"Provide a practical and widely used method of viewing the interior surface of drill pipe after that surface has been suitably cleaned."

9. **Pressure leak and penetrating tests.**—"Do not appear as probable methods of testing, except to detect cracks completely through the pipe wall."

10. **Mechanical caliper and gage tests.**—"Now widely used to detect changes in the outside diameter of drill pipe. An internal caliper which provides a graphic record has been used widely on tubing. Due to corrosion of drill pipe, pitting often occurs in the form of fine, deep pinholes which are difficult to detect with mechanical calipering devices traveling at any reasonable speed, and tiny fatigue cracks cannot possibly be detected."

From the conclusions of the above study, it is evident that only two methods of inspection are widely used, Nos. 8 and 10. There were two more which offered considerable promise, namely Nos. 2 and 3. The other six ranged from "interesting" to "no application." Author Main, therefore, limited his discussion as given here to these two widely used types and also the two promising types.

Mechanical Caliper and Gage Tests (No. 10)

DRILLING & EXPLORATION CO. of Los Angeles and Dallas has developed a simple procedure of inspecting and gaging practice which is successful in eliminating many drill-pipe failures. This procedure was described to the author by Ralph Marshall and Robert Rose of that company.

The principal tool used in this procedure is the caliper shown in Fig. 1. This tool is fast and accurate. A man can inspect a joint by rolling the pipe and at the same time moving the gage along it, in a matter of very few minutes. During this relatively rapid gaging operation, any deep scores or other imperfections, including bad slip marks, can be noted.

The procedure is always carried out whenever the drill pipe is laid down. Generous use is made of orange colored paint to indicate the faults found. In fact, a great portion of the procedure deals with the markings to be used to indicate what is wrong with either tool joint or pipe. This rolling procedure also discloses any deviation from straightness and the kinks or bends in the pipe are marked and must be straightened before it is used again.

At first glance, it might appear that abrasive wear on the outer surface of drill pipe alone would only effect a reduction in the tensile and torsional strength. It has been observed, however, that when worn joints were eliminated from a string, the number of failures was greatly reduced. Investigation disclosed that frequently, when worn joints were cut open, the interior surface of the pipe was found to be pitted from corrosion and fatigue cracks were sometimes found, originating in these pits. Another commonly found condition was where slip cutting was very severe and which, in some cases, actually re-

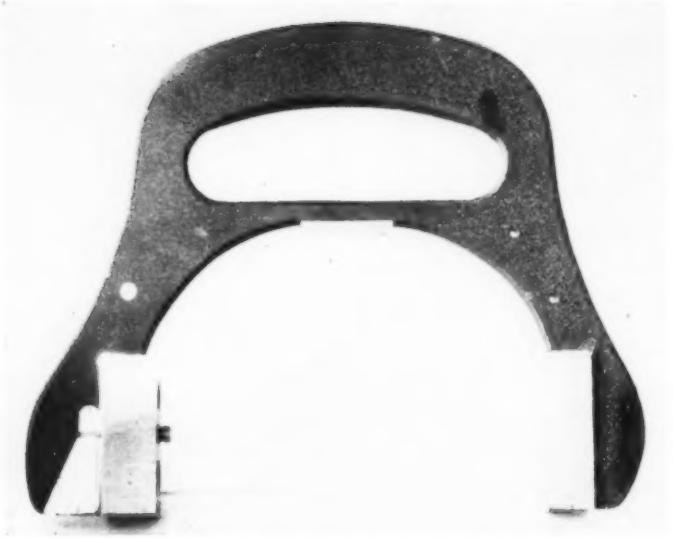


Fig. 1—Photo of drill pipe caliper (discussion of use is given under "Mechanical Caliper Gaged Tests" at beginning of article)

duced the pipe diameter. Here again the same inside pitting was sometimes observed.

The foregoing is more readily understandable when it is considered that any highly stressed piece of steel or highly stressed part of a steel member corrodes more rapidly than the same steel with less stress. For example, bent bars after being immersed in a corrosive liquid become very severely corroded at the bend—although they are attacked very little in areas not bent (where there were no residual stresses).

A badly worn section in a length of drill pipe is ample proof that side pressure was exerted at that point, adding heavy bending stresses to the tension and torsion stresses of normal service. The high stresses involved where slip marks indicate that the pipe has been "pinched in" (perhaps by stopping the pipe with slips instead of the break) are obviously of the order of magnitude of the yield point of the steel, throughout the pipe wall. Therefore, the presence of corrosion pits at such points might readily be expected.

The proponents of simple gaging practice do not claim that they can find all the possible cases of incipient failure. The merit of their procedure is its simplicity and low cost, and it certainly does eliminate some potential fishing jobs. The problem then boils down to elementary economics—viz: How much more can the operator afford to pay to get rid of the other incipient failures.

In some instances where drilling is extremely hard on pipe, where failures are frequent and costly, when pipe is hard to get, and when delays due to fishing cannot be tolerated, then a few dollars spent on more thorough drill-pipe inspection and tests will pay dividends.

Somewhere between the two is a reasonable place to land. With rig time worth from $30 to $75 an hour, depending upon the size and character of the rig, the hazards are becoming greater and the elimination of each failure more valuable. But even under present-day high rig prices, no one should advocate "going completely overboard" in this matter to the point where drill-pipe inspection costs become too great a burden on the operator's pocketbook.

Luminous Energy Tests (No. 8)

(This section was written by M. W. Newman of Pacific Tubular Service Co., a subsidiary of Ventura Tool Co.)

Long obvious to the oil industry is the need for a means of inspecting oil tubular goods internally, to check on internal surfaces for various types of defects which occur. Despite the most careful engineering practices and metallurgical research, producers and operators must consider the possibility of tubular goods failure at crucial moments.

The ways and means of making internal inspections had for some time interested Fritz Huntsinger, owner of Ventura Tool Co. and developer of the Tuboscope. How to inspect the inside of drill pipe, casing, tubing, and similar goods? How to do it efficiently and expertly? These were the questions which started the development of the instrument known as the Tuboscope. So 12 years ago, following months of research and development, the device was perfected and placed in operation.

Since the problem of drill-stem failures is the one of greatest importance in the industry, as far as inspections are concerned, the equipment used in its inspection will be discussed first.

In the internal inspection of new and used drill pipe, the Tuboscope has inspected more than 6,000,000 ft. of drill pipe in this area.

The instrument consists primarily of a system of lenses set in tubes. A light source, consisting of a mercury-vapor lamp, and an angle mirror are located at the front end and a focusing eye piece is at the rear end of the tube. When moved through the pipe being inspected, two images are apparent—an annular image and an angle mirror image.

A wide-angle objective lens, at the front end of the instrument, makes it possible to see down the pipe for a distance of about 9 in. at one time, and simultaneously shows the entire internal surface for that distance giving the annular image. A supplementary angle mirror, located in the center of the image and just behind the illuminating lamp, gives a perpendicular image of a small area of the pipe. This allows an unobstructed annular view as well as a perpendicular view of any one area.

The magnification of the image varies in inverse proportion with the internal diameter of the article being inspected, with the angle mirror magnification always slightly greater than the annular magnification.

Magnetic Field Tests (No. 3)

(Also by M. W. Newman)

In the external inspection of used drill pipe and tool joints the Magnaflux or magnetic-particle method has proved to be most accurate and thorough. In connection with this equipment, a motor generator is provided as a source of power and also electronic equipment is necessary to supply a rectified alternating current, or pulsating direct current. The equipment is designed to give magnetic particles optimum mobility and sensitivity under field conditions.

When inspecting used drill pipe, the magnetizing current is passed through several turns of a hand-held coil which sets up a magnetic field parallel to the longitudinal axis of the pipe. The direction of this field is transverse to fatigue cracks which develop circumferentially in drill pipe. The entire length of the joint, including the tool joints, can be checked by moving the coil along the complete length and magnetizing at intervals. As the coil is moved, the inspectors apply a gray or red Magnaflux powder by means of power blowers. The inspectors observe indications of defects immediately during and after the application of the powder.

An answer to another phase of the

drill pipe inspection problem is being developed by Tuboscope Co. in conjunction with Magnaflux Corp. That is the use of the Tuboscope and Magnaglo in the location of internal fatigue cracks. The Magnaglo, or Magnaflux means of inspection by fluorescence under black light is done by using a special Magnaflux paste for use in the wet method.

The paste is mixed with an oil base which holds the fluorescent, ferromagnetic particles in suspension. When the magnetic field is induced, using the same coils and equipment as is used externally in the Magnaflux operation, sudden interruptions of this field by discontinuities in the structure crowd some of the magnetic flux outside the internal surface of the pipe. This leakage in the field attracts and holds the particles when the fluid is sprayed inside the pipe, thus forming definite indications of the location, extent and shape of fatigue cracks. These indications can be seen easily with the Tuboscope during internal inspection.

Combined Tests (Nos. 3, 8, and 10)

The location of mill defects of a serious nature in new drill pipe is done with the Tuboscope internally and by inspecting the surface externally. Defects such as pits are measured with the pit gage attached to the head of the instrument and laminations, seams, upsetter wrinkles, and so on are judged as to seriousness by the skill and experience of the inspector.

To illustrate the use of inspection equipment when used drill pipe is serviced, suppose one joint is taken through a complete inspection operation, the operation to include the Tuboscope, Magnaflux and Magnaglo methods in the manner in which present plans call for the operation to be carried out when the Magnaglo aspect is fully developed. First, the pipe must be cleaned to provide clean internal surfaces. For this purpose a buffing tool is provided, operated by an air drill, which rotates a wire brush throughout the length, while air pressure is used to blow matter out of the buffed pipe. Recently shotblasting of new drill pipe has been been proved effective in removing mill scale.

Next, a No-Go gage is passed along the complete length of the joint to check on areas of wear, particularly those of eccentric wear. Areas of wear which result in wall reductions of over 20 per cent are classed as unfit for deep-hole drilling under high stresses. At the time of the gaging, a notation of the area and amount of wear is put on the pipe—this to be used later in the correlation of external wear and internal pitting.

After being gaged, the pipe is processed for the internal and external inspection, that is magnetizing and spraying the magnaglo fluid internally. The operator then starts to insert the Tuboscope to search for fatigue indications which can be readily seen with the black light. Readings are also taken with the pit gage of the depth of corrosion pittings to be correlated with the external wear to obtain the amount of over-all wall reduction. During this time the Magnaflux method is being employed to check for fatigue cracks externally, on the body of the pipe and also in the threads of the tool joints.

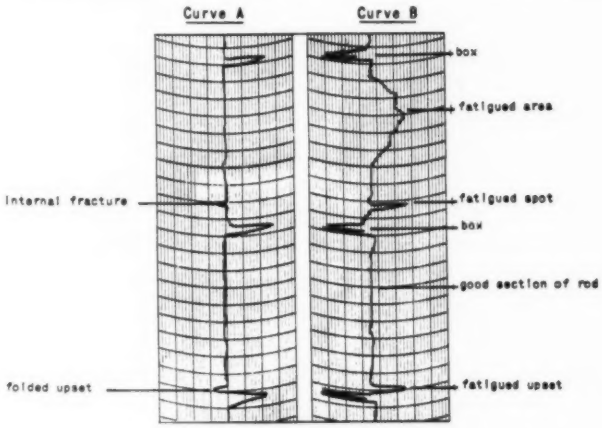
Electro-Magnetic Induction Test (No. 2)

Sclerograph Corp., Oklahoma City, has developed a very interesting system of magnetic induction testing which was described in The Oil and Gas Journal issue of May 6, 1948, pp. 83-84. We are not familiar with this development here on the coast and unfortunately did not contact with the Sclerograph people in time to include a suitable report here.

We also have here in California a good example of electromagnetic induction testing, which was developed by Emmett Irwin, who presents the following discussion.

A method of nondestructive testing of steel, known under the trade name of Induflux, has been in use for over 6 years. In recent months, portable equipment has been constructed and used in the oil fields of the Los Angeles Basin for the testing of sucker rods and, to a limited extent, drill pipe. The equipment uses the principles of the magnetic induction or magnetic analysis art to test for variations in the physical properties of the steel caused by differences in chemical analysis, heat treatment flaws or development of fatigue. When used for the testing of used sucker rods or drill pipe, the fatigue developed due to service is of major interest. By measuring the amount of this fatigue development, those members which have developed the greatest fatigue may be determined and then retired from service before failure occurs.

The Induflux method of testing uses the principle that the magnetic properties of the steel specimen can be directly correlated with its physical characteristics. The method of testing consists in passing the rods or pipe through a coil having primary and secondary windings. The primary



Interpretation of Curves

Curve A — Internal Resistance Curve		Curve B — Magnetic Properties Curve	
Left Deflection	Right Deflection	Left Deflection	Right Deflection
Indicates Higher electrical resistance of steel Produced by	Indicates Lower electrical resistance of steel Produced by	Indicates Increased electrical permeability Produced by	Indicates Decreased electrical permeability Produced by
Lower quenching temperature	Higher quenching temperature	Higher draw temperature	Lower draw temperature
Longitudinal flaws or fractures	Increase in cross-section of specimen	Physical softness	Physical hardness
		Increase in cross-section of specimen	Fatigue
Rods of different chemical composition will have different positions on chart.		In general, rods having the greatest resistance to fatigue will be positioned farthest to the left.	

Fig. 2—Data for electro-magnetic induction tests (Induflux)

winding is excited with an alternating current which magnetizes the specimen. The specimen in turn induces a voltage in the secondary, which voltage is modified by the physical properties of the specimen. Variations in this secondary voltage may be analyzed to determine the physical properties.

In the testing of rods and pipe, the readings are recorded on a chart which is moved in synchronism with the movement of the specimen through the coil, thus giving a permanent record of the condition of each foot of the specimen. No electrical connection is made with the specimen and the record is not affected by dirt and foreign material on the surface; eliminating the necessity of an expensive cleaning operation.

In Fig. 2 is shown a typical curve which is obtained from a sucker-rod test. The same type of curve is obtained with a drill-pipe test, except that the appearance of the curve in the neighborhood of the tool joints is considerably different.

The chart obtained from the test has two curves which are simultaneously recorded and which are independently affected by variations in the physical characteristics of the material under test. Curve A is the grain-structure curve and is affected by any factor which changed the internal electrical resistivity of the material. As shown in the chart accompanying the curves, these factors may be the quenching temperatures when the material was heat treated, longitudinal flaws, or a change in cross-section of the specimen.

Curve B is the magnetic-properties curve and is affected by the physical hardness of the steel, increase in cross-section and, most important in the testing of used material, fatigue. This latter factor is indicated by a right reflection in curve B, and the specimen is excited during the test in such a manner as to make this characteristic stand out prominently. Only a limited amount of training is required to enable one to interpret the curves intelligently.

The method of testing by passing the rods and pipe through a coil gives an accurate indication of the stress conditions in the surface layer of the material, but does not give an indication of the internal conditions since the depth of penetration of the magnetic flux is shallow, being in the order of ⅛ in. This provides a very satisfactory test for sucker rods, since the fatigue is of the corrosion-fatigue type where failure starts at the bottom of the corrosion pits. It also gives a very accurate test of the outside condition of the drill pipe, showing stresses set up by the slips and other conditions in their true proportions.

Limitations of Testing Methods

The obvious limitation of mechanical calipering and gaging methods is that the grading or selection of usable pipe is based solely on those defects which are readily seen and can be measured, on the outside surface of the pipe. It is estimated that less than one-third of the serious defects are uncovered by this method.

In the case of luminous energy tests (inside visual inspection) the operator gets a chance to view the remaining vulnerable surface and, with the advantage of some magnification. Again, however, only those things which can be seen readily determine the status of the pipe.

When Magnaflux is added to exterior inspection, then some defects which are not discernible to the eye are brought out, and when Magnaglo is used in conjunction with inside visual inspection, it is probable that some otherwise hidden defects will be uncovered. The fact that actual cracks have to be developed in the steel before these tests become effective is their prime limitation, and there is also the problem of evaluating the indications of cracks found by these methods in terms of probable further service life.

The present limitation of electromagnetic induction testing is that it uncovers so many things that there is some difficulty in interpreting the results in terms of probable service life. It is obvious that serious defects are reliably disclosed by electro-magnetic induction, and the recorded magnetic properties of pipe with no imperfections at all are easy to recognize. However, the ones which are neither very good nor very bad seem to present a problem.

In-Fill Drilling

(Continued from page 70)

depth: the overburden is not sufficient to withstand the high pressures which would be required to create a water drive through the tight pay zones. Also, the fractured nature of the pay zones would lead to extensive bypassing.

For the above reasons Pine Island operators have been greatly interested in the possibilities of the Hydrafrac process. The two chalk rock jobs performed to date were by Stanolind on its Dixie Hill lease, about 3 miles from Pine Island proper. The two wells had been drilled last August and were pumping 4 and 5 bbl. daily, respectively. They each had about 25 ft. of exposed chalk pay and had been acidized upon completion.

Both were treated with the Hydrafrac process in April. After the load oil was recovered one well showed a 44 per cent high productivity and the other a 37 per cent increase. The production gains, however, were short lived and by the end of a month both were producing practically at their former levels. Because the jobs reportedly were confined to the upper chalk member the results obtained are not believed to be representative of the method's real possibilities.

References

1. J. B. Clark, "Hydrafac Process for Increasing Productivity of Wells," The Oil and Gas Journal, p. 76, October 14, 1948.
2. A. F. Crider, "Pine Island Oil Field, Caddo Parish, Louisiana," fourteenth annual field trip of Shreveport Geological Society, p. 6, June 1939.
3. C. D. Fletcher, "Structure of Caddo Field, Caddo Parish, Louisiana, A.A.P.G. Structure of Typical American Oil Fields," p. 183, Vol. 2, 1929.

Long-Chain Alcohols—A New Petrochemical

(Continued from page 76)

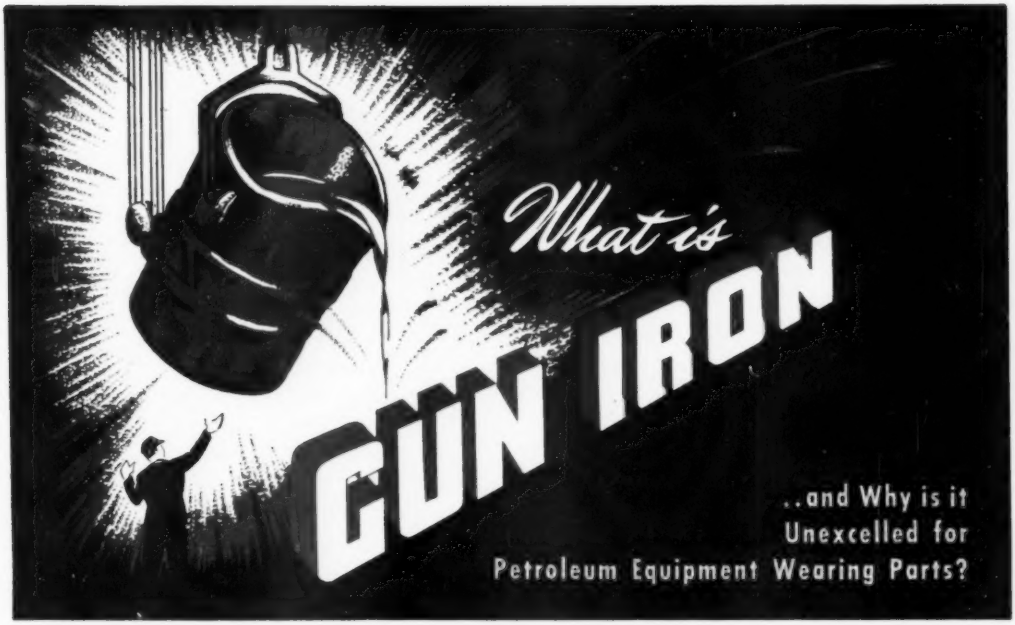
may be looked upon as intermediates in the production of other long-chain compounds. Some attention has been paid to their conversion to fatty acids for use in soaps. This outlet has not, however, been very promising because of the peculiar odor caused by soaps prepared from Oxo products.

By preparing acids and alcohols from suitable olefins and esterifying the products, it has been possible to prepare excellent lubricating oils with pour points below —70° C.[12] Other products prepared from Oxo alcohols include cutting oils, hydraulic fluids, essential oils, and diesel oils of remarkably high cetane numbers.

There are numerous other potentialities and possibilities for these new products of the petrochemical industry. Long-chain primary alcohols already have a strong lease on life. The full scope of their usefulness must be determined by the developments of the future.

Bibliography

1. Ellis, C., The Chemistry of Petroleum Derivatives I, 386 (1934).
2. Evans, T. H., et al, Ind. Eng. Chem. 30, 55-58 (1938).
3. Technical Oil Mission Microfilm Reel 72, Item 78.
4. Anon. Chemical Industries 63, 211-212 (1948).
5. Anon. Chem. and Eng. News 27, 245 (1949).
6. Fischer, F., and Tropsch, H., Brennstoff Chem. 4, 276-285 (1923).
7. Reichl, E. H., The Synthesis of Hydrocarbons and Chemicals from CO and H_2, U. S. Naval Technical Mission in Europe, Technical Report No. 248-45 (PB 22841), (Sept. 1945).
8. Holroyd, R., Report on the Investigation by Fuels and Lubricants Teams at the I. G. Farbenindustrie A. G. Leuna Works, Merseburg, Germany, U. S. Bureau of Mines Information Circular 7370 (July 1946).
9. Smith, Hawk, and Golden, J.A.C.S. 52, 3,221 (1930).
10. U. S. 2327066, O. Roelen, vested in U. S. Alien Property Custodian (1943).
11. Holm, M. M., et al, The Oxo Process, FIAT Final Report No. 1,000 (1947).
12. Wender, I., and Orchin, M., Critical Review of Chemistry of Oxo Synthesis, U. S. Bureau of Mines Report of Investigations 4270 (June 1948).
13. Technical Oil Mission Microfilm Reel, 14, Frame 670.
14. Hall, C. C., et al, Interrogation of Dr. Otto Roelen of Ruhrchemie A. G. B.I.O.S. Final Report No. 447 (1946).

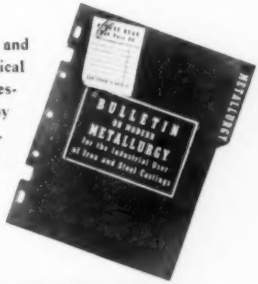


Hunt-Spiller Gun Iron is not new. In fact, its original development dates back to the founding of this company in 1810. Through the years, it became widely known in the production of guns of many types, including the famous Dahlgren cannon mounted on the U.S.S. *Monitor* of Civil War renown. Hence, the adoption of the term "Gun Iron."

In its present form, it is recognized as one of the best materials available for wearing parts in drilling rigs, pumps, compressors, engines and other equipment used in the petroleum industry. Melted in an air furnace (similar to an open hearth furnace), Gun Iron has uniform chemical, physical and structural characteristics . . . a 100% pearlite microstructure. Unalloyed Gun Iron has an average tensile strength of 40,000 PSI, as compared with 30,000 PSI for ordinary gray iron. When alloyed or specially quenched, its strength can be raised to 45,000–50,000 PSI and Brinell hardness increased from 215 to 450-500. Strength and hardness will hold up to 850°F, with a strength loss of only 12% at 900°F.

In its application to parts which are subject to friction—many of which are cast and machined by Hunt-Spiller—Gun Iron's dense, evenly-graphited structure and uniform strength and hardness offer superior resistance to heat, wear and distortion. These same characteristics also assure more consistent machineability in the shop and more reliable and economical performance of the parts in use.

This interesting and highly informative metallurgical bulletin answers many questions as to what metal or alloy is best for specific purposes. Your copy will be sent, without obligation, upon request on your company letterhead.



HUNT-SPILLER GUN IRON • AIR FURNACE PROCESS • HSGI

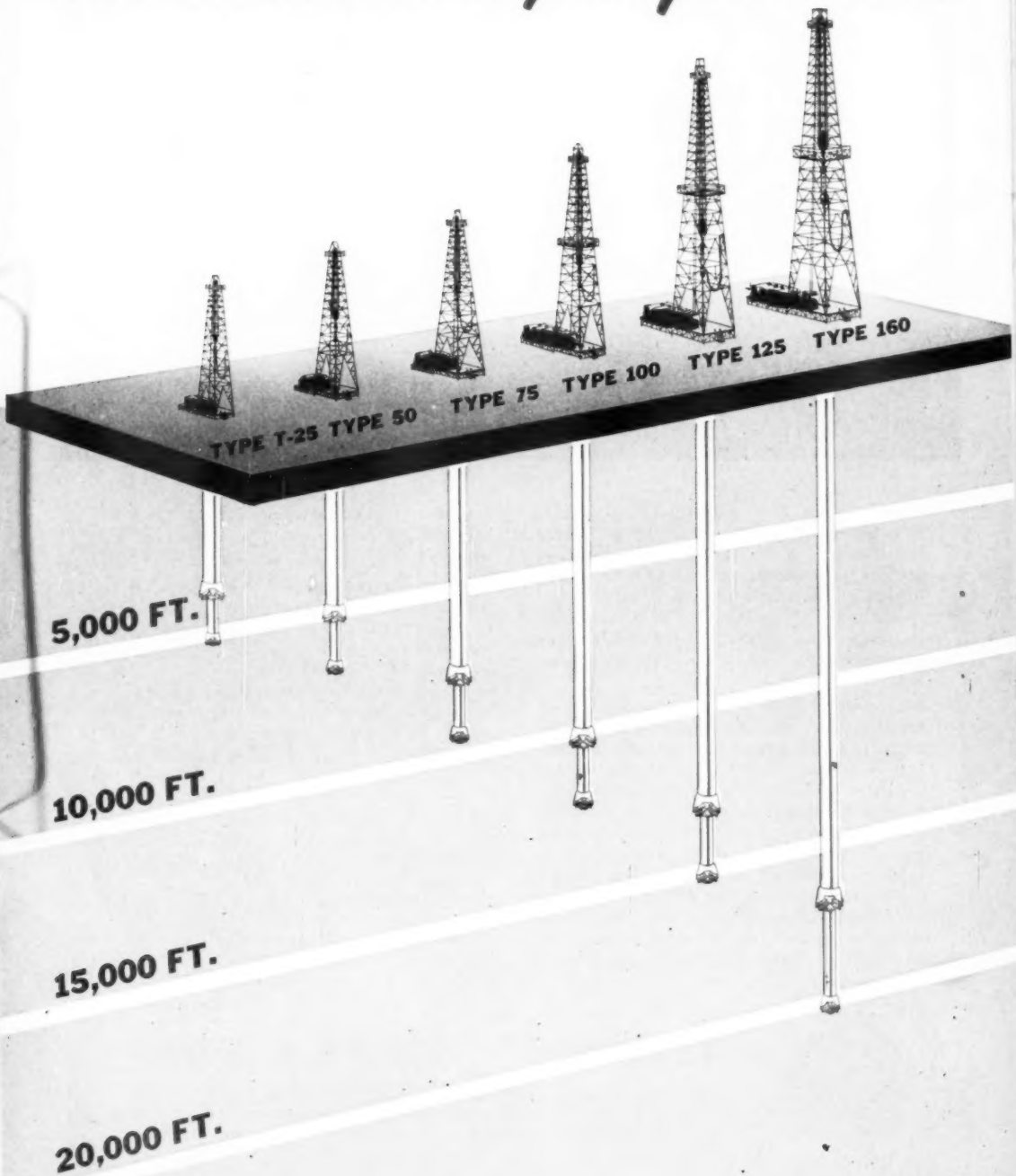
HUNT • SPILLER

MANUFACTURING CORPORATION

393 DORCHESTER AVENUE • SOUTH BOSTON 27, MASS.

Canadian Representatives: Joseph Robb & Co., Ltd., 4050 Namur St., Montreal 16, P. Q.

At whatever depth you drill...



FOR DRILLING ★ *THE INDUSTRY'S MOST COMPLETE*

MAKE IT COMPLETELY

NATIONAL

from the CROWN BLOCK to the DRILL COLLARS

You can rig up any of National's six Ideal Consolidated Rigs into a completely integrated National Supply outfit . . . from the Crown Block to the Drill Collars . . . engineered and constructed to work together with maximum efficiency and profit.

You will find that these carefully matched units rig up quickly . . . make hole faster and avoid many of the complications of maintaining machinery of diversified manufacture.

This single responsibility for product performance also incorporates one source of contact for engineering counsel and the convenience of concentrated field service for replacement parts and maintenance.

Write for descriptive literature or contact the National Supply Company representative near you. He will recommend the outfit best suited to your needs.

THE NATIONAL SUPPLY COMPANY

GENERAL SALES OFFICE: TOLEDO, OHIO

DIVISION OFFICES: CASPER; FT. WORTH; PITTSBURGH; TULSA; TORRANCE.
EXPORT: NATIONAL SUPPLY EXPORT CORPORATION, 30 ROCKEFELLER PLAZA, NEW YORK, N. Y., U. S. A.; RIVER PLATE HOUSE, 12 SOUTH PLACE, LONDON, E. C. 2.

THE NATIONAL SUPPLY COMPANY — NSCO — NATIONAL BLUE PRODUCTS

LINE OF OIL FIELD EQUIPMENT ★ FOR PRODUCTION

Gas compressor section for pressure-maintenance operation. The natural-gasoline-extraction facilities are not shown

Performance of
PRIMARY PRESSURE CONTROL

. . . . in the First, Second, and Third Zones, Newhall-Potrero Field

by Oran A. Graybeal*

NEWHALL-POTRERO oil field is located in the northern foothills of the Santa Susana Mountains about 35 miles north of Los Angeles. The discovery well, Barnsdall Oil Co. 1 Rancho San Francisco was completed on March 21, 1937, flowing 118 bbl. per day with total depth of 6,472 ft. (first zone). The second well was completed nearly a year later and found not only the first zone productive, but established production from the second zone also. The third well (also 1938), discovered production in the third zone and was completed with all three zones open.

Barnsdall 44 was completed as the discovery well in the sixth zone in 1945, establishing the first production below the third zone. Since then production has been obtained from other zones below the third, and the current drilling activity in the field is largely confined to the development of these deeper zones. The present paper, however, will be confined exclusively to a discussion of the upper three zones only.

Because of faulting and low permeability at the two ends of the structure, the portions of the upper three zones held by Barnsdall are effectively isolated. Therefore this paper will be further confined to that portion of the upper three zones under lands operated by Barnsdall. This includes all the reservoir which has participated in the current primary pressure-control project, and that portion of the first, second, and third zones will be referred to collectively as the 123 pool, of 620 acres. As of January 1, 1949, there was a total of 58 wells, of which 43 were producing from one or more zones, 9 were shut in, and 6 were being used as gas-injection wells (see Fig. 1).

Structure and Stratigraphy

The average well encounters about 6,500 ft. of upper and lower Pliocene beds of the Pico and Repetto forma-

*Chief reservoir engineer, Barnsdall Oil Co., California division, Los Angeles. Summarization of paper presented at A.P.I. meeting of Pacific Coast district, Division of Production, Los Angeles, May 12-13.

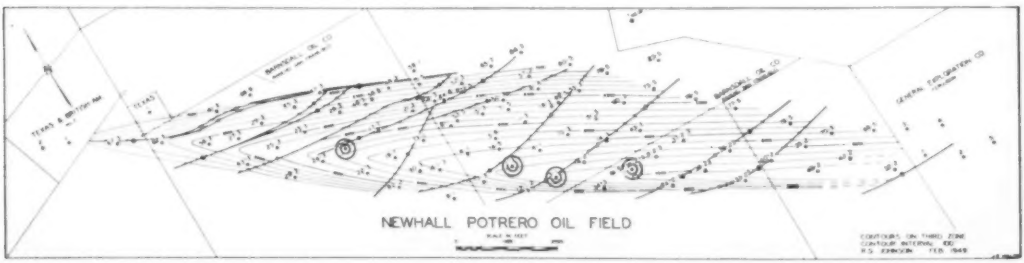


Fig. 1—Subsurface structural configuration of reservoir. Gas-injection wells are double circled

MISSION ROLLING DOG SLIPS take hold instantly and positively. No jumping or slipping!

They release instantly and easily. No sticking and freezing!

This fast, positive action in handling pipe speeds up round trips tremendously.

Protection of the pipe is another important matter. They fully encircle and support the pipe, with a uniform, cushioning grip.

Now offered in the sturdy "post type" with replaceable handles, here illustrated. The slips can now take repeated hard blows from the elevators without damage.

Makers also of MISSION Slush Pump Pistons, Valves, Gland Packings and Super-Surfaced Rods . . . MISSION Plug Valves . . . MISSION Swabs.

MISSION MANUFACTURING CO.
HOUSTON 14, TEXAS
Export Office: 30 Rockefeller Plaza, New York 20, N. Y.

Detail of Rolling Dog

Mission ROTARY SLIPS

. . . have a *mission* . . . to save you money!

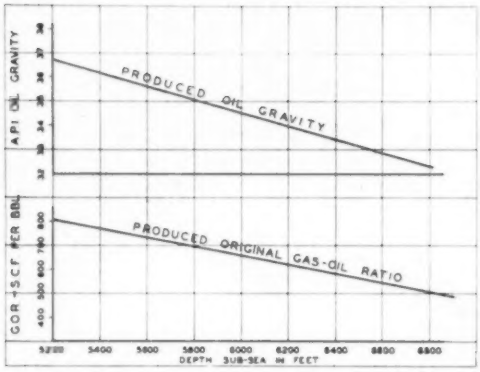


Fig. 2—Relation of oil gravity and gas-oil ratios, with well depth

tions. The first zone is located approximately 200 ft. below the top of the Miocene. The three upper zones are of Delmontian age in the upper Miocene series.

The first zone is about 375 ft. thick in the northwestern portion of the field (see Fig. 1). This interval is composed of many members, is extremely lenticular, and in many cases can scarcely be correlated from well to well. Water is encountered relatively high, although very irregularly. The interval is productive over less than one-third of the field.

The second zone lenses out to the northwest, and attains its greatest thickness of 340 ft. in the southeastern end of the field. It is more regular than the first zone, but is of extremely low permeability and is also productive over about a third of the field.

The third zone, the most important of the three, is a massive sandstone reaching its greatest thickness in the northwest end of the field. It gradually thins and finally lenses into shale near the southeastern end of the field. This zone accounts for about two-thirds of the recoverable oil from 123 pool.

Reservoir Characteristics (Also See Table 1)

The reservoir rocks of the three zones are quite typical of California Miocene sands, generally poorly sorted, contain large amounts of silty and argillaceous material, and are relatively low in permeability. There has been insufficient core analysis accurately to determine the average permeability. Some wells have averaged as high as 200 md. whereas others have averaged as low as 16 md. for dry air permeabilities. By correlating available core analysis with productivity indices and other data, it is estimated the weighted average dry air permeability is probably about 75 md. Based on well performance and reservoir behavior it is believed that under initial reservoir conditions the average effective permeability to oil was probably about 6 to 8 md.

Because of the more uniform nature of porosity, it is believed that the average 17.7 per cent obtained by core analysis is probably representative of the reservoir, at least so far as any determinations on dry laboratory samples may be expected to be representative of true reservoir conditions. Based on numerous restored-state interstitial-water determinations, it is estimated that 30 per cent of the average pore space is occupied with water.

Characteristics of Reservoir Fluids

From all information available it is believed that no appreciable gas cap existed in any zone originally. Original gas-oil ratios of all wells, with two exceptions to be discussed later, fell reasonably well on the lower curve of Fig. 2. The gas-oil ratios obtained from high wells indicated that the upper portion of the reservoir was probably very nearly fully saturated. Lower in the reservoir, however, it was clear that the oil was undersaturated, with the degree of undersaturation increasing markedly as the lower flank positions were reached.

Based on laboratory determinations made on bottom-hole samples, but with these observed values adjusted as believed necessary from correlations with reservoir performance, the weighted average fluid characteristics which have been accepted as representative are shown in Table 2. It will be realized that in a reservoir with as large a structural relief as this one, a total oil column of 1,900 ft. for three zones or a total of 1,300 ft. in the third zone alone, it is necessary to adjust and weigh values such as these in order to yield values which will have some significant meaning and usefulness.

The general procedure of weighting such values involves determining the distribution of the net void reservoir volume available for hydrocarbons as a function of depth. If the variation of some quantity with depth is known, the weighted average may then be readily obtained.

No extensive depth-pressure surveys were made in the field on shut-in wells prior to 1941, although earlier flowing surveys at two or more rates on the same well gave some control on the early reservoir pressures. It is believed that the original pressure at —6,000-ft. (subsea datum), which is very near the mean center of gravity of the reservoir, was approximately 3,100 psi. There are some indications that original pressures were slightly different in different fault blocks, but since this is not based on actual static surveys and is of relatively small magnitude, this possibility has been largely discontinued and ignored.

Production History Prior to Gas Injection

The production history of 123 pool is set forth in Fig. 3. Largely because of the absence of offset obligations until the two ends of the field were reached, the development proceeded rather cautiously and slowly. Table 3 is a brief summary of these operations by years.

It will be noted (Fig. 3) that the pool average gas-oil ratio did not consistently exceed 1,000 cu. ft. per bbl. until early in 1943. Prior to that time, however, many of the wells located high on the structure had begun to exhibit significant increases in produced gas-oil ratios. As early as March 1942, wells showing this tendency

TABLE 1—RESERVOIR CHARACTERISTICS

	Acre-feet
Bulk sand volume:	
First zone	28,300
Second zone	16,100
Third zone (including T zone)	75,700
123 pool total	120,100
Quantitative properties of oil sand weighted averages:	
Dry air permeability, md. est	75
Dry air porosity, per cent	17.7
Interstitial-water saturation, per cent (estimated)	30
	B/D psi
Productivity indices, referred to original reservoir condition except as noted:	
Average original productivity index, including triple-zone wells	1.08
Highest original productivity index, including triple-zone wells	3.70
Lowest original productivity index	0.04
Average current productivity index, wells now producing	0.41

TABLE 2—RESERVOIR FLUID CHARACTERISTICS

Average produced oil gravity, A.P.I.	35
Average reservoir temperature, °F.	170
Average original reservoir pressure, at —6,000 ft. subsea, psi.	3,100
Average bubble-point pressure, psi.	2,775
Average original dissolved gas, cu. ft. per bbl.	650
Average viscosity of bubble point oil, at reservoir temperature, cp.	0.72
Average original formation volume factor	1.351
	Mol per cent
Composition of reservoir fluid:	
Methane	40.04
Ethane	5.35
Propane	6.80
Isobutane	1.20
n-Butane	3.59
Pentanes	3.16
Hexanes	3.25
Heptanes and heavier	36.61
	100.00

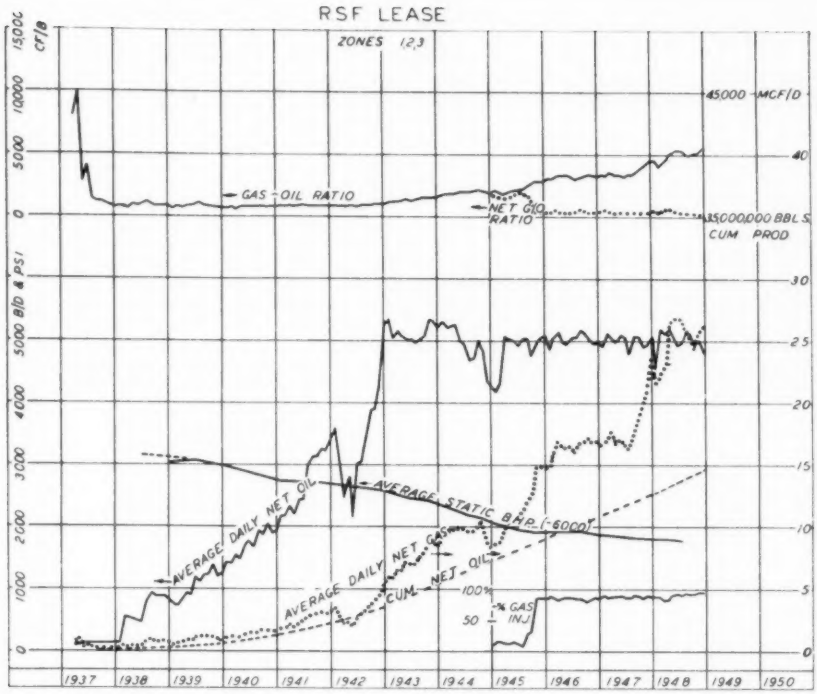


Fig. 3—Charts of production data and gas injection for Newhall-Potrero field. Location, 35 miles north of Los Angeles

were shut in, inaugurating a fundamental policy which has been rigorously followed since then, of conserving the natural reservoir energy as much as practical by producing only the lower-ratio wells.

There was no fixed ratio at which wells were shut in, but, in general, wells which produced was gas-oil ratios exceeding the 123 pool average ratio by a factor of two or more were usually shut in. In all cases, these wells which were shut in were located relatively high on the structure. This indicated qualitatively that gravity segregation effectively influenced producing gas-oil ratios to some extent at least, although this behavior was accentuated in that top structure wells reached their bubble point pressure sooner than did lower wells.

It was considered undesirable to permit the natural energy of the dissolved gas to be dissipated in causing a mass migration of reservoir fluids up flank to the low-pressure region located on top the structure. Although permeabilities in the field may seem relatively low, calculations showed that with steep dips gravity drainage could be appreciable. It was concluded that improved reservoir recovery efficiency could be reasonably expected if the force of gravity were permitted to assist the movement of oil toward the producing wells, rather than allow gas expansion to elevate oil within the reservoir against gravity.

Pressures in the field were watched carefully. Each month production was reallocated among wells through the application of empirical formulas in which were introduced the gas-oil ratio, bottom-hole pressure, and productivity index of each individual well. This program of equalizing pressures throughout the 123 pool was pursued relentlessly, and was reasonably successful. It may be realized that this procedure resulted in a continual shifting of production to the newer wells as they were completed, with the older wells carrying a lesser and lesser share of the load, and many ultimately being shut in entirely.

Despite careful control of the distribution of pressures throughout the reservoir, average pressure declined approximately 250 psi. per year at the 5,000-bbl.-per-day rate.

In Fig. 4, the average reservoir pressure has been plotted against the cumulative oil withdrawals. It will be noted that prior to gas injection the relation is reasonably linear and shows that the removal of 7,250 bbl. of oil lowered the average by 1 psi.

TABLE 3—PRODUCTION HISTORY OF 123 POOL

	New wells com-pleted	Wells redrilled, deepened or recomp.†	Wells worked‡
1937	1		
1938	3		
1939	3		
1940	8	2	
1941	12		
1942	5		
1943	9		
1944	3		
1945	4		4
1946	7		2
1947	3	1	5
1948	1	3	1
Total	*59	6	12

*One well has been abandoned in 123 pool due to proximity to a gas injection well and recompleted during 1945 in a lower zone. †In a different zone. ‡For isolation of zones.

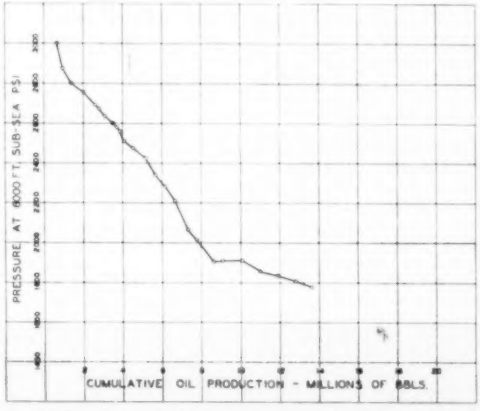
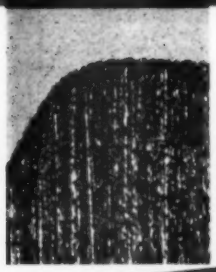


Fig. 4—Average reservoir pressure vs. cumulative oil withdrawals

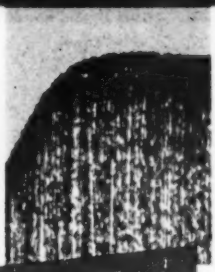
AMERICAN IRON DRILL COLLARS

STOP EXCESSIVE THREAD GALLING AND FAILURES

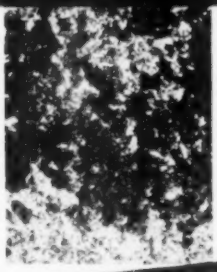
Photomicrograph of normal untreated machine thread



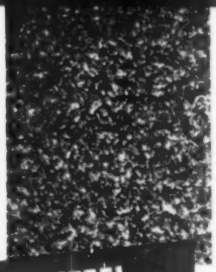
Microized thread shows penetration of micro film



Non-uniform structure that causes galling and failures



Uniform micro structure of steel in American Collars



AMERICAN IRON'S NEW MICROIZING PROCESS

Here's protection that stops excessive thread galling! American Iron's Microizing Process for drill collar threads applies a protective micro film which not only treats the thread surfaces but also penetrates into the surface pores of the steel (as shown above)! This prevents adhesion of the two threaded connections! That's why our Microizing Process gives positive protection against excessive thread galling!

HIGH ALLOY STEEL INSURES HIGHER IMPACT VALUES

Today's drill collars must have the very highest physical properties . . . properties that insure high impact values! That's why American Iron now uses a special high alloy steel to obtain a highly uniform micro structure (as shown above) from surface to thread areas. This fact, plus proper, full-length heat treating, results in the physical properties that insure high tensile and impact strengths in our drill collars.

ACCURATE BORING of circulation hole insures a well-balanced collar throughout—one that'll hold whip to a minimum. That's why our collars are precision bored to rigid API specifications on our hydraulically controlled Gun Boring Machines!

FULLY HEAT TREATED for longer wear! After forging and straightening, collars are heated to normalizing temperature; reheated for hardening quench; tempered for uniform structure; again reheated for straightening and stress relief.

REMEMBER, THERE IS AN AMERICAN IRON SERVICE MAN IN EVERY ACTIVE FIELD!

AMERICAN IRON & MACHINE WORKS CO.
Oklahoma City, Oklahoma—Box 1177—Phone L. D. 518—District Office, Houston, Texas—Export Office 420 Lexington Ave., New York City, N. Y.

AMERICAN IRON & MACHINE WORKS CO. A OKLAHOMA CITY U.S.A.

As time went on and more was learned about 123 pool, it seemed increasingly unlikely that there would be any assistance from an active edgewater. This has since been confirmed and it is now believed that 123 pool is of the "depletion" type.

Gas-Injection Project

Declining pressures meant (1) less pressure differential available to force oil into the producing wells, (2) viscosity of the reservoir oil was increasing. Since most of the wells had rather low productivity indices, it was apparent that rapidly declining pressures would soon result in rapidly declining producing capacity.

An intensive study was undertaken in 1944 to determine the advisability of augmenting the natural reservoir energy. The problem was considerably simplified in that the entire reservoir which might be expected to actively participate in such a program was located on a single lease, involving only one operator and one lessor. The pool was automatically unitized from the beginning.

The study showed that the program yielding the highest economic return from the pool required that all available gas be returned to the reservoir. It was estimated that the recovery of crude oil would be increased by about 41 per cent over that obtained by conventional depletion. Moreover, it was determined that the net present worth of 123 pool could be increased in an even greater proportion. This is made possible by a substantial reduction in average lifting costs, a marked increase in the recovery of natural gasoline, and by permitting the rate of withdrawal to be maintained at a higher level than would be possible by depletion.

Experimental pilot operations conducted in late 1944 established that gas could be returned to the reservoir satisfactorily with surface pressures of approximately 2,000 psi. Full-scale gas return to the reservoir was started in October 1945. To date the residual gas obtained from Barnsdall wells in other zones has been injected along with the 123 pool gas. At present the proportion of gas from other zones accounts for about 10 per cent of the total and results in a current injection rate equivalent to 95 per cent of the net gas produced from 123 pool.

To begin the program, wells 1, 3, 20, and 36 were selected as input wells since they appeared to be located strategically on the structure. Well No. 1, which had been deepened and recompleted as a triple-zone well in 1940, was reworked so as to leave only the third zone open. Well No. 3, also a triple-zone well, was reworked so that the first and third zones remained open with a cement blank liner section shutting out the second zone and providing space for a packer. By this means gas could be injected into the first and third zones independently. Well No. 20, open to the third zone only, was used without further work. Well No. 36, originally completed with the second and third zones open, was recompleted with only the second zone open.

Results Subsequent to Gas Injection

Pressures throughout the zone were carefully watched to ascertain the results of full-scale gas return. The first complete depth-pressure survey following the initiation of the project was made in January 1946. In this 3-month period significant changes in pressure trends were noted in many of the wells, although those most remote from injection wells did not show any effect until later. Several wells increased in pressure by more than 200 psi. in this short time with no observable change of producing gas-oil ratio.

As a necessary phase of successful primary pressure control, a major workover program to isolate zones in producing wells throughout the field was undertaken shortly after gas injection was started. Prior to this time there had been no production data on even such essentials as the amount of oil and gas produced from the first zone. The data on the other two zones was only partially complete, although the production data on the three combined was available and complete. This explains why it is necessary to treat 123 pool as one reservoir to a large extent, even though it appears to divide itself naturally into several.

In the course of this program of zonal separation it was found in several cases that wells which had previously produced at such high gas-oil ratios that they were shut in, could now be recompleted as low-ratio wells when individual zones were tested separately. It was also found that reservoir pressures were often several hundred pounds per square inch different in the various zones at the same location. Although lacking rigorous proof, there were several cases where thiefing of large volumes of oil by a lower pressure zone for extended periods of time in the past was strongly indicated.

As mentioned earlier, the effective permeabilities in the second zone are extremely low. At the present time the average productivity index of these wells is about 0.05. As might be expected, gas injection has shown negligible effect on the rate of pressure decline in such wells. Since the southeast area second zone wells constitute only about 10 per cent of the total recoverable oil in 123 pool, the lack of successful primary pressure control in this area does not seriously detract from the success of the entire project.

In the third zone, the results of primary pressure control have been very encouraging. After the major pressure barriers were located, it has been found possible to effectively control reservoir pressures throughout the major part of the zone. It appears that these pressure barriers are probably not complete pressure seals across the field, but represent zones of restricted reservoir permeability.

Conclusions and Summary

With the exception of the second zone where pressure control has proved impractical to date, it is believed that the program of primary pressure control in 123 pool can be considered a success. After 3½ years of operation, the project remains economically sound. Except for one well, there have been no exorbitant increases in gas-oil ratios beyond what could reasonably be expected.

Although no tracers have been used in the project, there undoubtedly has been an appreciable amount of the injected gas produced from the producing wells. However, this was to be expected and was taken into consideration in determining the economics of the program in the beginning. In fact during the entire life of the project it is anticipated that the volume of gas injected will amount to nearly four times the total gas reserves of the pool.

An examination of Fig. 3 shows that without gas injection the average 123 pool reservoir pressure on January 1, 1949, would have been in the neighborhood of 1,200 psi. instead of 1,750 psi. as it actually was. At this lower pressure it would be impossible to produce 5,000 bbl. per day without excessive waste of gas since it would require producing top structure high-ratio wells at high rates.

It is estimated that without gas injection a reasonable estimate of the MER would now be from 3,000 to 3,500 bbl. per day. At the lower pressures, even this rate of production would require more artificial lift than now is necessary while producing 5,000 bbl. per day.

After 3½ years of gas injection, it may be concluded that the pool has produced approximately 1 million barrels of oil more than would have been possible without excessive waste in the same time under depletion. However, in addition to producing more oil to date, the present worth of the reservoir today is considerably better than it would otherwise have been.

BOOKS

THE MAGIC OF OIL. By Ray Bethers. Published by Aladdin Books, 554 Madison Avenue, New York. 48 pp. $2.

This is a simple word and picture story of oil, not intended for persons conversant with the oil industry, but for those to whom oil is an unfamiliar subject, and for boys and girls.

QUESTIONS on TECHNOLOGY

by W. L. Nelson

Consulting Engineer

Motor Selection

What are the types of motors used for various refinery services?—A.C.C.

Electric motors are used for so many different services that the following discussion must be most general. The discussion by M. A. Hyde (Refinery Power Equipment) in the March 30, 1939, issue of The Oil and Gas Journal is excellent. It pertains mainly to refinery services whereas the bulletin entitled, "Handy Guide for Quick Selection of Electric Motors," by Allis Chalmers, deals primarily with the mechanical details of motor construction and performance.

There are four general types of motors used extensively in the refining industry:

1. Open or standard. — These are used only for applications involving no explosion hazard such as motors for machine tools, conveyor drives situated outdoors, etc.

2. Enclosed fan cooled.—These are much the same as open motors except for protection from dust, dirt, water, etc., and the greater loadings that are possible by fan cooling.

3. Explosiveproof.—Class I Group D motors of the National Electric Code are used by insurance underwriters, apply to conditions presenting no greater hazard than high-test gasoline-air mixtures. These motors can withstand an internal explosion and confine the flame to the motor casing.

4. Splashproof. — These motors are used only in nonhazardous refinery areas.

In addition, inert-gas-filled motors can be used in hazardous areas. Finally, Class II motors by the National Electric Code are used for atmospheres that contain combustible dust, as follows:

Group F—Carbon black, coal, or coke.

Group G—Grain.

The various refinery applications are indicated in Table 1.

Hard Asphaltum

We have a diesel-fuel-oil specification that requires a "hard asphaltum" maximum of 0.3 per cent. What is hard asphaltum?—P. R. C.

A requirement regarding asphalt is not common in diesel-fuel-oil specifications. The only hard-asphalt specification with which we are familiar is the "asphaltenes" test of the Institute of Petroleum, I.P. 6/45. It is applicable to gas oil, diesel oil, fuel oil, lubricating oil, and crude oil which has been topped to 200° C. (392° F.). Ordinarily, diesel fuel oil would not contain asphalt but, of course, crude oils, poorly fractionated products, etc., that are sometimes utilized as diesel fuels, might be examined for asphalt.

The test for asphaltenes is conducted by contacting a 10 g. or smaller sample (enough to provide about 0.25 g. of asphaltenes) with I.P. petroleum spirit. The precipitated asphalt is extracted with more boiling petroleum spirit, and is then extracted with hot benzene. The residue left by evaporation of the benzene is called "asphaltenes" or "hard asphalt." The test method is described in detail in Specification 6/45 of the Institute of Petroleum (Manson House, 26 Portland Place, London W. 1.) in the Ninth Edition (1948) of its Standards Methods for Testing Petroleum and Its Products. The method is said to be superior to the somewhat similar Holde method because it more completely eliminates wax.

Transportation Abbreviations

What is the meaning of the letters L.T.L. in connection with freight shipments, or perhaps you can direct us to a listing of such symbols.—B.R.C.

The letters L.T.L. refer to "less than truck load" and is similar to the following usages:

C.L.—car load.

L.C.L.—less than car load.

T.L.—truck load.

L.T.L.—less than truck load.

K.D.C.L.—knocked down car load.

S.U.C.L.—set up car load.

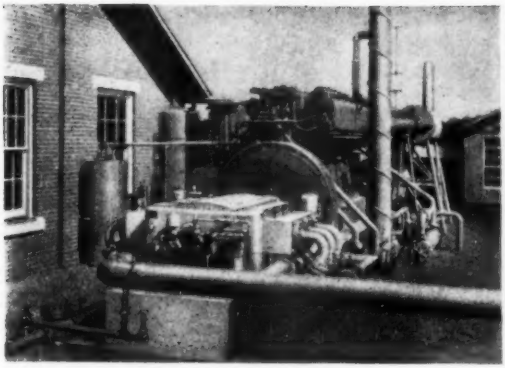
These and other abbreviations are listed in "A Glossary of Traffic Terms and Abbreviations," by William J. Knorst, and issued by Traffic Service Corp., 418 South Market Street, Chicago.

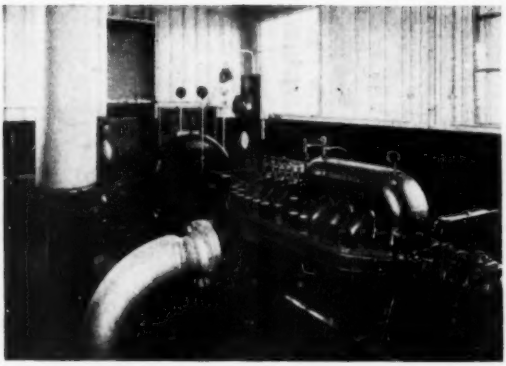
The abbreviation for the word "empty" is interesting. It is Mty.

TABLE 1—TYPICAL MOTOR APPLICATIONS (FROM M. A. HYDE)

Application—			Motor types				
			For hazardous areas			For nonhazardous areas	
Pumps, centrifugal	Typical hp	Typical speed*	Explosion-proof 600 hp. and below	Inert gas-filled, above 600 hp.	Pipe ventilated	Splash proof	Enclosed fan cooled
Crude charging	200- 500	3,600	D	D	D		
Hot-oil charging	250-1,200	3,600	D	D	D		
Reflux	50- 200	3,600	D			D	
Residue	25- 200	3,600	D			D	
Transfer	10- 100	900-1,800	D			D	
Cargo loading	100- 500	900-1,800	D		D		
Water supply	100- 500	400-1,200				D	
Fire	50- 300	1,800-3,600	D			D	
General	3- 500	600-3,600	D			D	
Pumps, reciprocating							
Hot-oil charging	100- 500	200- 400	G			G	
Vacuum	15- 100	300- 600	G or GM			G or GM	
Pumps, rotary	25- 200	900-1,200	D			D	
Blowers	25- 150	400- 900	D			D, B or G	
Cooling-tower fans	10- 30	250- 450					GM
Compressors, reciprocating	25- 400	150- 400			D (Syn.)	B	
Chillers	3- 10	15- 25	GM				
Filters	3- 20	10- 50	GM				
Centrifuges	2- 7½	3,600	B			B	
Valves	¼- 2	900-1,800	D				D (enclosed)
Material handling	2- 50		D			B, GM	

Symbols: D Direct drive. GM Gearmotor. Syn. Synchronous motor. G Geared. B Belted. *Speeds are given as nominal speed at input shaft of driven machine, i.e., as pinion speed for machines comprising gears.





Left: Experimental installation of a direct-connected 400-r.p.m. supercharged dual fuel (natural gas-crude oil) engine driving a reciprocating pump. Operated in crude-oil trunk-line service. Right: Steam-turbine-driven centrifugal pump at Continental Pipe Line Co.'s Ville Platte station which can move 28,000 bbl. daily through the 76-mile, 8-in., crude-oil line to the Lake Charles, La., marine terminal. Steam is furnished by Continental Oil Co.'s Ville Platte gasoline plant

ADVANCES IN *Pipe-Line Pumping Equipment*

Past 10 Years Have Brought Significant Improvements

by J. H. Cahill*

IN the recent advances in petroleum pipe-line techniques, there have been notable improvements in pumping equipment. An example of the evolution of such equipment may be cited the case of two contrasting stations now operating on a western line. At one station an old single-cylinder horizontal oil engine with a 15-ft.-diameter flywheel drives a duplex pump which was originally installed in 1912 and moved to its present location in 1928; it will probably operate there for 10 more years. At the next station down the line there is a modern turbocharged dual-fuel engine driving an advanced type of 10-cylinder reciprocating pump moving 30,000 bbl per day at 1,000 psi. This unit occupies about a third of the space of the old single-cylinder unit and pumps three times as much oil. In developing new high-speed units, some difficult problems had to be solved because of the fact that when first installed, the vibration was so intense that the header welds crystallized and broke. The transition from 85 to 400 r.p.m. has certainly modified previous pipe-line concepts.

*Chief engineer, Continental Pipe Line Co. From presentation at the Mid-Continent chapter of the American Society of Mechanical Engineers, Tulsa.

The field of pipe-line engineering has changed extensively in the last 10 years. Gradually, line sizes have become larger, reflecting more effective applications of hydraulic principles. Economics and hydraulics have determined the optimum pipe sizes. The average diameter line has grown from 4 to 12-in; now 31-in. is the largest crude-oil line being laid. Gathering systems which used to be 2-in. are now 4 and 6-in. with 8 and 12-in. not uncommon. The pipe shortage has had a great deal of influence on pipe sizes in the last 3 years, resulting in many looped lines which for good engineering practice should have been rebuilt in larger sizes.

Engine and Pump Changes

Perhaps the greatest change has been in engines and pumps. Some lines, particularly products lines, have gone extensively to electric motors for prime movers.

Diesel and gas-diesel firms have offered engines with high efficiency suitable for using pipe-line crude oil as fuel and for using field gas, widely available at low costs where pipe lines exist. Engines with efficiencies up to 40 per cent are now on the market at costs, even in the present era of high prices, of less than the old heavy gun-barrel types. There is even a full diesel on the market which is suitable for direct connection to centrifugal pumps without the use of separate stepup gears. Interesting also is the large increase in portable, high-capacity skid-mounted units.

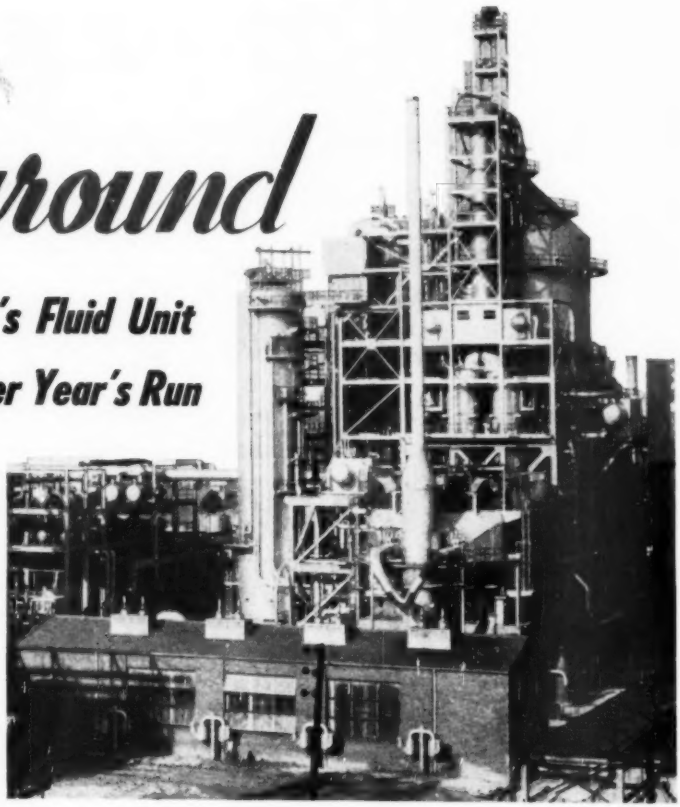
The old type slow-speed reciprocating pumps turning from 30 to 80 s.p.m. were usually belted to a big steam engine or to one of the old heavy slow-speed gas or diesel engines. Centrifugal pumps entered pipe lining as the next step in over-all improvement; these were usually connected through either belt drives or stepup gears to obtain the necessary speeds. The centrifugal pump for some applications was a tremendous improvement over the reciprocating type, particularly for trunk-line operation where the volumes and pressures were relatively constant. Development of rural power accelerated the use of electrical motors and increased the utilization of centrifugal pumps, direct connected without belts or gears.

The next step was the development of the multicylinder reciprocating pump which was adapted for high speeds and direct connection to medium-speed prime movers. These pumps, starting with the three-cylinder type and later with nine cylin-

(Continued on page 97)

13 DAY Turnaround

Achieved at Sinclair's Fluid Unit At Marcus Hook After Year's Run



A total of 29,650 man-hours were used in the overhaul and inspection of the fluid catalytic cracking unit shown here. Rated at 28,000 bbl. daily the unit is installed in the Marcus Hook plant of Sinclair Refining Co.

ON March 13, 1949, refinery personnel at Sinclair Refining Co.'s Marcus Hook plant began the first complete overhaul and inspection of the largest operating fluid catalytic cracking unit on the East Coast. Turnaround was completed in 13 days and the unit was back on full stream March 26. This first inspection followed nearly a year of continuous operation of the 28,000-bbl. unit whose coke-burning capacity is rated at 22,000 lb. per hour.

During the run 8,360,145 bbl. of heavy gas oil ranging between 650° F. e.p. heating oil and 200 penetration asphalt were processed at an average stream day feed rate of 23,200 bbl. Maximum conversion with resultant maximum coke burned was maintained throughout the run. Stream efficiency for the run, including the turnaround and miscellaneous losses, was 96.2 per cent. Realization of this high efficiency can be attributed to three main factors which can be enumerated as follows:

1. The outstanding engineering job done in designing the unit, with maintenance problems in mind.

2. The planning and organization work done before the unit came down and the followup during the turnaround.

3. The enthusiastic cooperation and the high output of all crafts and workmen on the unit both during the run and during the shutdown.

To place any one of these items foremost would be a mistake. Successful handling of a maintenance problem of this magnitude requires all three. However, since the planning and actual work was done exclusively with local refinery personnel, there was no divided responsibility and a maximum of cooperation between crafts.

Some of the outstanding engineering features which aided in the turnaround are as follows:

1. Careful layout of vessels and piping, permitting free access to all items requiring service and inspection.

2. Permanent installation of hoist trolleys, cranes, or davits for all items requiring regular turnaround service.

3. Ground-level layout and space to accommodate truck delivery of heavy parts to the crane or hoist serving these particular items.

4. Installation of oversize manways; regenerator 74 in. and reactor 60 in.

5. A large size 200-ft.-per-minute, 2-ton-capacity freight elevator to the regenerator grid level.

6. A central service well and hoist serving all elevations of the unit.

7. Location of manways at main-floor levels.

8. Centralized grouping of control instruments.

9. Streamlining and sizing of lines and valves to minimize erosion.

10. Generous supply of catalyst cleanup, utility air, steam, and water connections throughout the unit.

The organized planning of this turnaround started as soon as the unit went into operation in March 1948. By the first of December 1948, plans for the shutdown had progressed to the point where working lists had been made up and given to all operating and maintenance foremen. These lists broke down all jobs in detail and included preliminary estimates of manpower requirements for each craft. As the time of the shutdown approached, revisions and additions were made to these lists and final plans were developed. The keynote of all the preliminary planning was not to do any work during the shutdown period which could be done while the unit was in operation. This policy was adopted to save manpower during the shutdown, and also to concentrate supervision on the jobs necessary during the shutdown.

Outstanding Features

Outstanding features of the organization of the job consisted of the following:

1. Designation of the plant assistant master mechanic exclusively to the turnaround as job foreman for a period of approximately 2 months

OTHER REPAIR BRANCHES

HOUSTON
FORT WORTH
ODESSA
WICHITA FALLS
SHREVEPORT
NEW ORLEANS
WICHITA, KANSAS

Now in Operation the —

SOUTHWEST'S FINEST

Factory Type

DIESEL REPAIR BRANCH

1350 EXCHANGE BLVD.
OKLAHOMA CITY

Here Cummins Diesel Experts are Available 24 Hours a Day

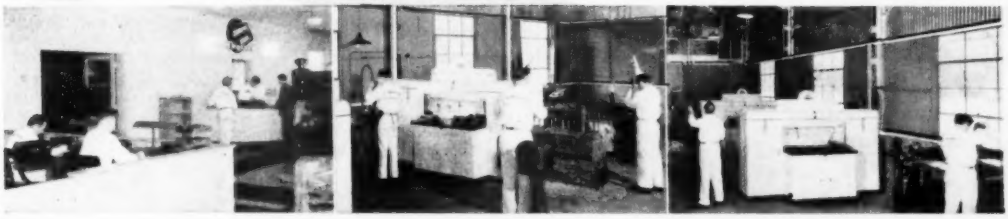
Experience gained in 15 years of rebuilding and servicing Cummins Diesel Engines has been used in the design and equipping of this new repair branch. Every time and labor saving device has been installed. The modern repair shop was designed to "get the mechanic out of the grease and grime" . . . to provide every facility for precision work. Unit rebuilding here with precision tools and by exacting methods lengthens periods between overhaul, reduces emergency failures, reduces parts replacement costs, and eliminates waste labor by efficient shop arrangement and work methods. The branch maintains complete stocks of parts . . . and specially equipped Cummins service trucks operate on round-the-clock call. Opening of this new repair branch is part of the Cummins Sales & Service, Inc., policy to provide top-flight service for Cummins Diesel users. So Standardize on Cummins Dependable Diesels.

EXCLUSIVE DISTRIBUTORS

CUMMINS DIESEL POWER

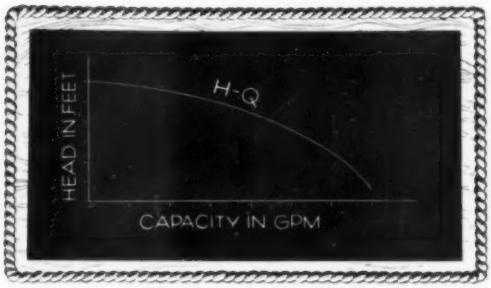
VIEWS INSIDE THIS BRIGHT, NEW MODERN REPAIR BRANCH SHOWING WHITE BAKED ENAMEL TOOL CABINETS, AND EMPHASIS ON CLEANLINESS AND ORDERLINESS.

CUMMINS
Sales & Service, Inc.
General Offices, Fort Worth, Texas



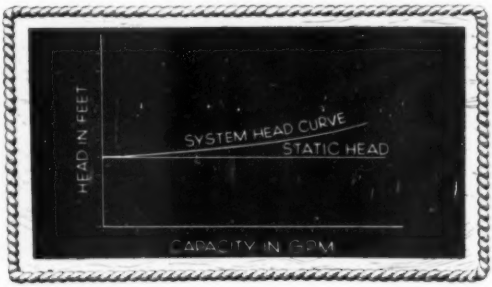
Pointers on Pumps

HOW MUCH WILL A CENTRIFUGAL PUMP DELIVER?



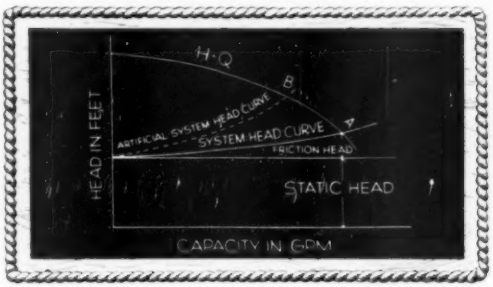
1 The capacity of a constant speed centrifugal pump whose head capacity characteristics (H-Q) are shown in Figure I on any piping system can be determined as follows:

2 Plot the friction loss through all piping, valves and fittings at different rates of flow. Use any standard friction tables, making allowances for age and condition of pipes.



3 Static Head is the difference between liquid levels in suction and discharge vessels plus the algebraic difference of pressure, between suction and discharge vessels, expressed in feet. Combining the friction head curve at different rates of flow with the static head gives the system head curve, which is total head in feet*.

*See method of calculating head described in previous advertisement in this series. We will gladly send you a copy.



4 When the head capacity curve (Figure I) is superimposed on the system head curve, (Figure III) the intersecting point "A" is the capacity that will be delivered by the pump on this system. If a smaller capacity is desired, partial closing of the discharge valve will produce an "artificial" system head curve, giving capacity at point "B". Any capacity between point "A" and shut-off (zero capacity) may be obtained by adjusting discharge valve.

ANY OTHER PROBLEMS?

Worthington's engineering department — backed by the longest and broadest experience in the field — will do its best to solve them. Because in addition to making the most complete line of pumps, Worthington makes its technical service fulfill the promise that *there's more worth in Worthington . . .*

Contact our nearest District Office, or write to *Worthington Pump and Machinery Corporation, Centrifugal Pump Division, Harrison, N. J.*

WORTHINGTON

C9-1

THE WORLD'S BROADEST LINE ASSURES YOU THE RIGHT PUMP FOR EVERY JOB

prior to the shutdown and throughout the turnaround. This man had power to direct all foremen and subforemen assigned to the unit.

2. The unit was completely equipped with a communication system consisting of additional telephones on the regular operating communication system, and in addition a public-address system was installed with speakers located around the unit. One man was assigned exclusively to the operation of the communication system.

3. A material dispatcher, with telephone facilities was located at a point where the material was received from storage and disbursed to the unit.

4. Materials had been checked extensively before the unit came down and were stored in designated areas adjacent to the unit immediately before shutdown.

5. Transportation equipment was assigned exclusively to the unit.

In Good Condition

After stripping, the unit was found to be in a generally excellent condition. The regenerator brickwork showed no wear at all and only three points of heavy erosion were found in the ducts:

1. The injection nozzle in the spent catalyst riser was renewed, as was the lower spent-cat slide valve.

2. The reactor cyclone spindles were renewed.

3. Some patching was required in the stripping well where steam impingement had caused erosion.

No other major repairs were necessary, although several changes were made to improve safety or facilitate maintenance:

1. The valves on the gas compressor suction were moved to a point outside of the building as a safety measure.

2. Valves were installed at the main fractionator condenser banks to permit maintenance without interruption of operation.

3. A bypass was installed on the fixed feed preheater to allow the tubes in the heater to be cleaned during the run on future operations.

The balance of the turnaround work was routine in nature, such as compressor and pump overhauling, tube-bundle cleaning, heater cleaning and repairs, and a thorough inspection of lines and equipment. It should be pointed out that since this was the first shutdown of this fluid unit, a more extensive opening of vessels and inspecting was made than might be normal. Part of this additional work was done for engineering and future planning purposes.

Work outlined above used a total of 3,760 man-hours prior to the shutdown and 25,890 man-hours during the shutdown itself. This man-hour utilization can be divided into crafts as follows:

Craft	Man-hours
Boilermakers	2,597
Bricklayers	535
Carpenters	1,487
Crane operators	216
Electricians	1,109
Insulators	751
Instrument men	1,441
Labor	3,590
Machinists	2,320
Painters	848
Pipe fitters	8,192
Riggers	1,923
Still cleaners	409
Transportation	326
Welders	3,916
Total	29,650

It is expected that from the experience gained on this turnaround, future shutdowns will be handled without increased down time even though increased repairs can be anticipated as the equipment ages.

Advances in Pipe-Line Pumping Equipment

(Continued from page 93)

ders and smaller plungers, eliminated a great deal of the inherent mechanical difficulty of the old plunger pump and gave greater operating flexibility than centrifugals. They were, nevertheless, still subject to pressure surges and vibration.

To obtain further flexibility and adaptability and to allow for the greater use of automatic controls in pipe-line pumping stations the variable-stroke pump was developed. This pump was designed to deliver varying quantities of fluid at constant pressures and constant speeds. Consequently it is suitable for operation with constant-speed prime movers and for remote control which tend to reduce operating costs. The next development in pumping equipment was the multicylinder single-acting pump having a very short stroke; this is a further attempt on the part of the pump builders to combine the smooth operation of the centrifugal unit with the flexibility and high efficiency of the piston pump.

There will be a continuing effort on the part of equipment builders toward manufacturing pumping units with higher efficiency, greater flexibility, and increased use of automatic controls to eliminate as far as possible the human element in station operations. The demand for such modern equipment will continue to increase as the effort to maintain the balance between increased labor costs and lower gross profits becomes more noticeable.

In the postwar period there have been new concepts of engines as well as pumps. Diesel power is gradually replacing gas in pipe-line operation. While diesels will never completely replace gas engines in all operations, diesels have advantages where the price of gas as a fuel has climbed from a low of 5 cents per M.c.f. to as much as 40 cents per M.c.f.

The increased use of diesel fuel and the smaller diesel fuel cuts which are being taken by refineries from crude oil, due to increased refining efficiency and striving for higher gasoline yields, has driven the price of diesel fuel to a point where it is uneconomical to use on pipe lines. However, as long as a pipe line pumps oil it has at its command a very cheap source of fuel in the crude oil in transit. While crude oil can be used for fuel in most low-speed diesel engines merely by applying proper filtering practices, both the medium and high-speed diesels which are coming into greater use for pipe-line pumping require narrower limits for their fuel than can be obtained from most crudes. It has proved profitable in some cases to use portable treating plants which have recently been developed to use waste heat from the engine exhaust to refine partially the crude oil into usable diesel fuel. *(See The Oil and Gas Journal, September 2, 1948, page 69.)*

The peculiar circumstances which have arisen due to increased crude-oil and products demands and pipe shortages have increased the demands for portable booster units. By operating these it has been profitable even to use high-priced diesel fuel. Such portable booster units have demonstrated that the modern high-speed diesel is as reliable and more economical than the old heavy slow-speed unit. Engine builders in the last 10 years have convinced pipe-line operators that the high-speed pumping unit is here to stay.

Engine efficiency has been raised to the point where any prime mover delivering less than 40 per cent thermal efficiency will be out of the pipe-line business before long. Increasing fuel costs will encourage pipe-line operators to aid the dual-fuel engine builders in their research. Furthermore, the development of the supercharger will play an important part in full utilization of the gas diesel.

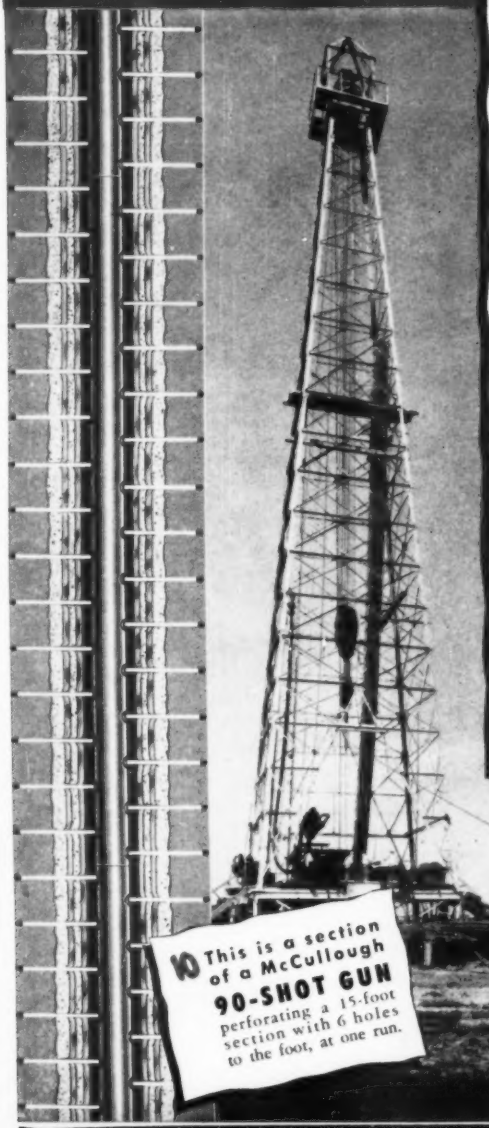
A.P.I. Safety Manual Is Now Available

Part II of a manual of recommended practices for further improving the safety factor in refinery operations is now available from the Division of Refining, American Petroleum Institute. The 15-page text with 6 appendices is priced at 75 cents.

The manual contains both general and specific information on recommended practices for inspection and maintenance of pressure relieving devices such as weight-loaded and spring-loaded valves and rupture disks.

Part I of the manual delt with process equipment. Four additional parts are planned, to cover fire protection equipment, storage tanks and spheroids, instruments, and electrical equipment.

10 GOOD REASONS WHY OPERATORS PREFER



McCullough
GUN PERFORATOR SERVICE

1. **MEETS EVERY CONDITION.** Guns fired either electrically or mechanically; guns run on cable, sand line, drill pipe, tubing, or on piano-wire measuring line in extremely high-pressure wells.
2. **SIMULTANEOUS FIRING** under all conditions gives exact spacing of shots, perfect perforation pattern, and saves down-the-hole time.
3. **ACCURATE DEPTH MEASUREMENTS** put the shots right where you order them.
4. **MAXIMUM PENETRATION** of bullets into the formation, as proved repeatedly in competitive field tests.
5. **GUNS TO FIT EVERY CONDITION.** McCullough employs more than 30 different types and sizes of guns.
6. **ALL SIZES OF BULLETS** from ⅜" dia. up to ¾" dia., to fit every possible need.
7. **BURRLESS BULLETS,** giving a completely burr-free hole, eliminating casing scraping, with *no* sacrifice of penetration.
8. **NO LOST TIME.** McCullough's simpler, lighter equipment cuts setting-up and moving-out time, speeds up every job.
9. **EXPERIENCED MEN.** With years of experience behind them, thoroughly-trained McCullough gun-perforating crews do their jobs quickly, efficiently, safely.

These Are Some of the Reasons Behind the Proven Fact That

McCullough

PUTS THE SHOTS WHERE THEY COUNT!

10 This is a section of a McCullough **90-SHOT GUN** perforating a 15-foot section with 6 holes to the foot, at one run.

McCullough TOOL COMPANY

5820 South Alameda St., Los Angeles 11, California
405 McCarty Avenue, (P. O. Box 2575) Houston, Texas

28 SERVICE LOCATIONS

TEXAS:			CALIFORNIA:	LOUISIANA:	WYOMING:
Houston	Tyler	Healdton	Los Angeles	Houma	Casper
Alice	San Angelo	MISSISSIPPI:	Avenal	Lake Charles	Cody
Cisco	Victoria	Laurel	Bakersfield	New Iberia	CANADA:
Corpus Christi	Wichita Falls	NEW MEXICO:	Ventura	Shreveport	Edmonton
McAllen	OKLAHOMA:	Hobbs	MONTANA:		
Odessa	Oklahoma City	KANSAS:	Cut Bank		
	Guymon	Great Bend			

EXPORT OFFICE: 30 Rockefeller Plaza, New York 20, N. Y.

ENGINEERING *fundamentals*

Phase Concepts

Behavior of Single Component Systems

A SYSTEM denotes that amount of substances within given boundaries and under specified conditions which is being considered. A system is said to be made up of a number of **components,** which are defined as those pure substances which produce the system under all conditions. Thus, a container of pure methane is a one-component system, one of methane and ethane, a two-component system.

A system is also said to possess **phases.** The phases of a system can be defined as the separate, physically homogeneous parts which are separated from one another by definite boundaries. By homogeneous it is meant that there can be detected no difference in physical properties throughout the phase region. Since all gases are miscible there is only one gas phase to a system. The fact that the gas might be dispersed in bubbles throughout a liquid does not mean that there are many separate gas phases. In a given system there may exist two liquid phases or more, and there may exist numerous solid phases.

A system is said to be in **equilibrium** under specified conditions when no change in the measurable physical properties of the system can be detected. A system displaced from its equilibrium will tend to go back to its equilibrium state. A general law of equilibrium can be stated to the effect that the relative amounts of phases present within a system will have no effect upon the equilibrium. Thus, one bubble of water vapor can be in equilibrium with a large amount of liquid water, or at the same conditions of pressure and temperature one drop of liquid water could be in equilibrium with a large amount of water vapor. Another general law of equilibrium between phases is that the rate of attainment of equilibrium is increased with an increase in the surface area of contact between the phases.

The simplest type system to consider is that containing one component. Specifying the pressure and temperature of a one component system is sufficient to determine whether one, two or three phases exist and what these phases may be. However, the relative amounts of the individual phases cannot be told unless additional information is given. The usual additional information given is the specific volume. When only one phase is present this quantity is the reciprocal of the density of the phase. Because of the usual statement of the specific volume of a system along with the temperature and pressure of the system the entire behavior is sometimes designated as **PVT behavior.**

A simple representation of the equilibrium between the vapor and liquid phases of a single component system is the familiar vapor-pressure curve, shown in Fig. 1. This type plot indicates those pairs of pressure and temperature values at which the gas and liquid phases of the pure substance can be in equilibrium. This graph may extend further to the left to show other equilibrium lines but does not extend further to the right.

A pictorial representation of the change involved between the points P_1, T_1 and P_2, T_1 of Fig. 1 is given in Fig. 2. From the pressure P_1 to P the system is all liquid which expands in volume. No vapor forms until the pressure P is reached. This pressure is called the vapor pressure, or "bubble point" of the liquid. When vapor commences to form the pressure P will not be lowered until all liquid has vaporized. Then a continuation of pressure reduction simply expands the gas phase that has formed. These four stages in expansion from P_1 to P_2 are shown on the more general PVT plot of Fig. 3. A series of such lines for various temperatures completely define the behavior of a single component system.

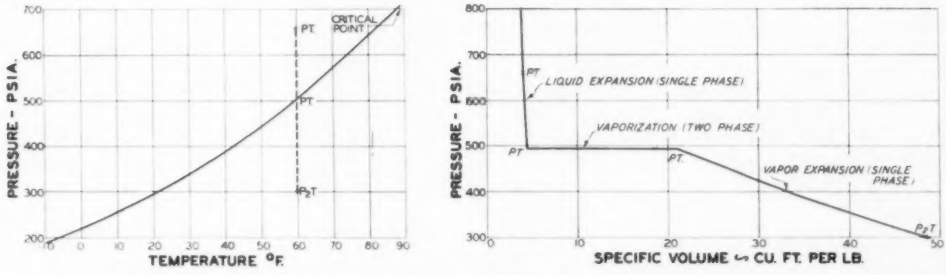
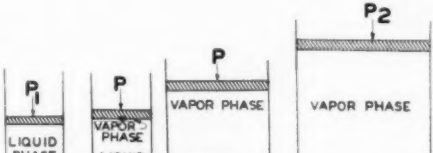
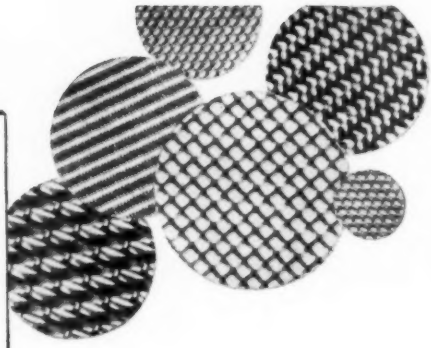


Fig. 1—(Left) Schematic representation of pressure-temperature plot of two-component system. Fig. 2—(Below) Schematic representation of phase changes in expansion of two-component system at constant temperature



Series by Dr. John C. Calhoun, Jr., Chairman, Petroleum Engineering School, University of Oklahoma

Compare this *Screen* and *Filter Cloth* with any you are now using!



FILTER and screen elements need not be weak spots in your equipment.

And they won't . . . if they're made of Monel*, Nickel or Inconel* wire cloth.

For these are the "task metals" of industry.

Compare their advantages with any fabric or metal cloth now causing you trouble. They're rustless . . . corrosion-resisting . . . strong . . . tough. They endure abrasive wear. They withstand extremes of temperature. They protect the purity of the material being handled.

Many equipment manufacturers already have standardized on elements of Monel, Nickel or Inconel. Maybe your manufacturer is one of them. But maybe he isn't. So speak to him. Let him know you want the protection of the "task metals" wherever filters, strainers or screens are used.

For new equipment *or replacements, specify elements made of Monel, Nickel or Inconel. All weaves and meshes are available. Any practical shape or size can be fabricated. For more information plus the booklet,* "ESTABLISHED WEAVERS OF WIRE CLOTH," *write to our Frank Bailey.*

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N. Y.

*Reg. U. S. Pat. Off.

Monel *
Nickel
Inconel *

"Task Metals" for Industry

EMBLEM OF SERVICE

Cost-imating

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

Instrumentation

SUCH a large number of instruments are employed in the process industries that the cost estimator is tempted to employ a percentage figure based on the total cost of the plant (or the cost of the Direct Process Equipment)—refer to Cost-imating No. 8 of December 9, 1948, entitled, "Summary Sheets for Cost Estimates." However, it is much safer to select instruments for each part of the process and use the itemized costs that will be published in Cost-imating No. 35 of June 16, 1949, under the title of Instrument Costs. In using such a method, the estimator must make many decisions which are disagreeable because a complete design is not yet available. However, the final cost is usually more dependable than to make the one grand decision involved in adopting a percentage cost for all instruments. Nevertheless, Table 1 shows the costs of instruments as a percentage of the plan cost. Most of these data were taken from D. M. Considine (Estimation of Instruments, Chem. Engineering, July 1947, p. 108) although J. McA. Harris (Process Design, Chem. Engineering Progress, 44, 333, April 1948) and Heppel et al (Equipment Costs . . ., Chem. Engineering, December 1946, p. 97) have contributed some overall figures.

TENTATIVE SCHEDULE OF TOPICS

No. 29—May 5, Centrifugal Pumps
No. 30—May 12, Pump Materials and Drives
No. 31—May 19, Large Motors
No. 32—May 26, Electrical Equipment
No. 33—June 2, Filter Presses
No. 34—June 9, Instrumentation
No. 35—June 16, Instrument Costs
No. 36—June 23, Compressors
No. 37—June 30, Refrigeration
No. 38—July 7, 1949 Cost Indexes

TABLE 1—COSTS OF INSTALLED INSTRUMENTS AS PERCENTAGES OF THE TOTAL PROCESS EQUIPMENT COST

General:	
Process industries,* per cent	5-10
Petroleum and related industries:	
Thermofor catalytic cracking	3.4
Alkylation, hydrofluoric acid	5.7
Gas recovery	4.9
Solvent dewaxing	3.0
Ethylene plants	4.0
Styrene plants	4.0
Natural gasoline plant†	2.1-3.5‡
Chemical plants:	
Viscose making	2.9
Pharmaceutical chemicals	15.0
Agricultural chemicals	9.7
Perfumes and cosmetics	5-10†
Ammonia, synthetic	3.2
Sulfuric acid, contact	3.0
Nitric acid	2.0
Hydrochloric acid	1.9
Fluoride salt manufacture	1.1
Lime plants	0.45†
Soap	2-3.2§
Metal refining, non-ferrous electrolytic	0.91
Pulp mills	3.0
Textile mills	1.5
Superphosphate plants	negligible

*Harris, J. McA., Jr. †One plant showed 19 per cent. ‡One plant showed only 0.39 per cent. §A more complicated plant showed 8.6 per cent. ¶Nissan, A. H., J. Inst. Pet. Tech. 24, 69 (1938).

APPROXIMATE COST INDEXES—INSTRUMENTS—1946 = 100

	Composite instruments*	Refinery labor*	Temperature instruments†	Pressure gages†	Flow instruments†	Control valves and regulators†
1928	100	57				
1929	98	59				
1930	95	57				
1931	95	57				
1932	90	48				
1933	85	49				
1934	80	55				
1935	80	58				
1936	80	60				
1937	82	65				
1938	85	67				
1939	90	68	90	90	90	90
1940	90	69	90	90	90	90
1941	91	71	91	92	93	92
1942	91	79	91	95	94	90
1943	91	87	90	95	94	90
1944	90	90	90	95	94	90
1945	90	94	90	95	94	90
1946	**100**	**100**	**100**	**100**	**100**	**100**
1947	113	119	111	109	102	117
1948 est	115	154	114	112	103	120
1949 est	113	150	110	108	103	116

*Cost-imating No. 1, Oct. 21, 1948, p. 141. †General and Auxiliary Machinery, Bur. of Labor Statistics, U. S. Dept. of Labor.

Labor and auxiliaries.—The percentages given in Table 1 are for complete installations including control valves, relief valves, safety valves, instrument piping, electrical wiring for instruments and the control board.

The instrument labor costs that will appear next week (Cost-imating No. 35, June 16) show only the direct labor in setting the instruments, but the costs of wiring, auxiliary air supply, and of the panel board installation can be included as a 20-30 per cent item based on the total cost of the instruments (and their direct labor). The instrument material costs of Cost-imating No. 35 already include the costs of instrument control valves.

Although panel board is not in itself a large part of the instrument board cost, Table 2 indicates the effect of thickness of black panel board on the cost, and may be used for special installations:

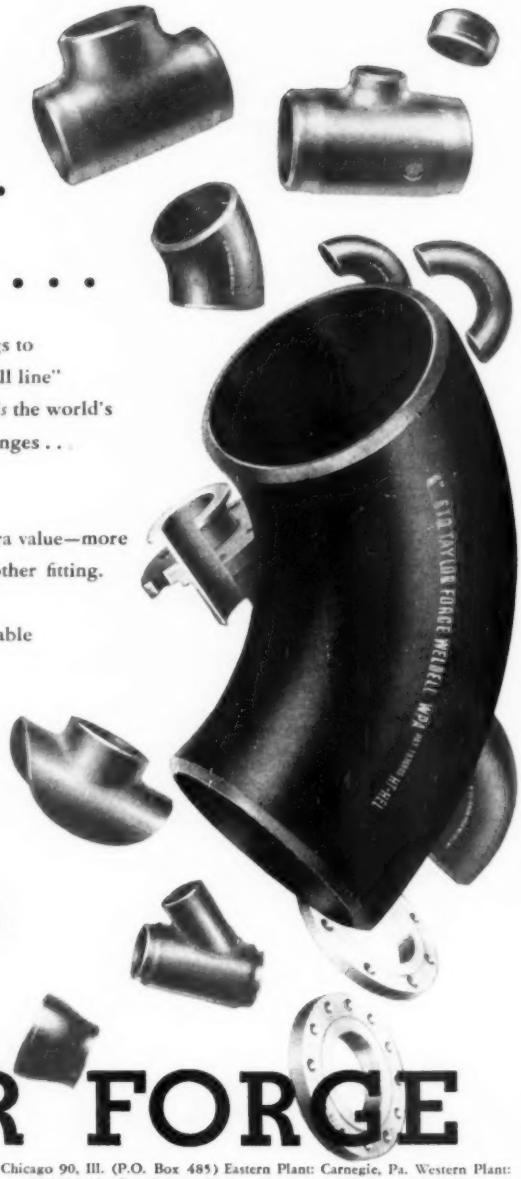
TABLE 2—APPROXIMATE COST OF BLACK PANEL BOARD (1946)

(Sheets 36 x 48 in., 42 x 48 in., and 42 x 96 in.)

Thickness, in.	Cost, $ per sq. ft.
1/8	0.88
1/4	0.95
3/8	1.18
1/2	1.39
5/8	1.73
3/4	1.84
1	2.06
1 1/2	2.68
2	4.55
3	6.83
4	9.10

No. 34 in a series by W. L. Nelson, professor of petroleum refinery engineering, University of Tulsa

FULL LINE . .
FULL VALUE . . .
FULL SERVICE . . . .



We have repeatedly urged users of welding fittings to accept no less than the *full line.* When we say "full line" we don't just mean its *completeness* . . . though it *is* the world's most complete line of forged steel fittings and flanges . . and it *does* contain the widest range of types, sizes, weights and materials.

When we say "full line" we mean full value—extra value—more and better features than can be found in any other fitting. The technical brains and forging skills which conceived these extra values continue to be available to you through the Taylor Forge organization, and through the Taylor Forge distributor who is your industrial neighbor.

Since Taylor Forge welding fittings "have everything," why compromise on less than the best?

TAYLOR FORGE

TAYLOR FORGE & PIPE WORKS General Offices & Works: Chicago 90, Ill. (P.O. Box 485) Eastern Plant: Carnegie, Pa. Western Plant: Fontana, Calif. • District Offices—New York: 50 Church Street • Philadelphia: Broad Street Station Bldg. • Pittsburgh: First National Bank Bldg. • Chicago District Sales: 208 S. LaSalle Street • Houston: City National Bank Bldg. • Los Angeles: Subway Terminal Bldg.

Do your piping systems create any fitting or flange problems for you?.....

If the information you need goes beyond the simple return of the coupon at the right, please write us fully. You will receive a prompt and detailed reply.

☐ Who is my nearest Taylor Forge Distributor?

☐ Put my name on your mailing list to receive informative literature.

Name_____

Position_____

Company_____

Street Address_____

City_____ Zone____ State_____

506-0649 Mail to Taylor Forge & Pipe Works, P.O. Box 485, Chicago 90, Illinois

OIL and GAS EQUIPMENT Digest

THE OIL AND GAS JOURNAL

offers this "Check It" service for the convenience of its busy readers who realize the need to keep informed on the many items of new or improved equipment that are continually being introduced.

Postage Will Be Paid by Addressee

No Postage Stamp Necessary if Mailed in United States

BUSINESS REPLY CARD
Permit No. 3A, 510 P. L. & R., Tulsa, Oklahoma

THE OIL AND GAS JOURNAL
BOX 1260
TULSA, OKLAHOMA

Postage Will Be Paid by Addressee

No Postage Stamp Necessary if Mailed in United States

BUSINESS REPLY CARD
Permit No. 3A, 510 P. L. & R., Tulsa, Oklahoma

THE OIL AND GAS JOURNAL
BOX 1260
TULSA, OKLAHOMA

KEEP INFORMED!

this EASY way

SAVE TIME

TEAR OUT CARD

CHECK IT

MAIL IT

THE OIL AND GAS JOURNAL

offers this "Check It" service for the convenience of its busy readers who realize the need to keep informed on the many items of new or improved equipment that are continually being introduced.

Keep informed on what is new in equipment that will work for increased efficiency and lower costs in your operations. *Save Time* by using only one card to get information on every item of interest to you. *Tear Off the card* below. *Check It. Mail It.*

No Postage Required

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

For further information—without obligation—I have checked numbered circles above

Corresponding to new equipment items or trade literature abstracts in the Oil and Gas Equipment Digest of The Oil and Gas Journal, June 9, 1949

PLEASE PRINT

COMPANY NAME .....

STREET ADDRESS .....

CITY ..... ZONE NO. ..... STATE .....

NAME ..... TITLE .....

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

For further information—without obligation—I have checked numbered circles above

Corresponding to new equipment items or trade literature abstracts in the Oil and Gas Equipment Digest of The Oil and Gas Journal, June 9, 1949

PLEASE PRINT

COMPANY NAME .....

STREET ADDRESS .....

CITY ..... ZONE NO. ..... STATE .....

NAME ..... TITLE .....

OIL AND GAS EQUIPMENT Digest

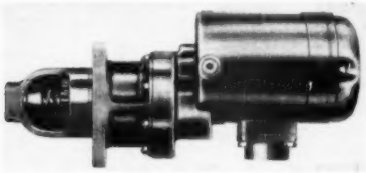
IT'S NEW CHECK IT

by Dan B. Miller

(1) DEEP-WELL TURBINE PUMP. This new line of deep-well pumps may be selected for widely varying well diameters, capacities, and heads. Three assembly sizes fit wells from 6 in. to 24 in., or larger. Several impeller designs are standard for each size in each of the three bowl types and provide more than 100 individual impeller designs of varying hydraulic characteristics. *Byron Jackson Co., Pump Division.*

IT'S NEW CHECK IT

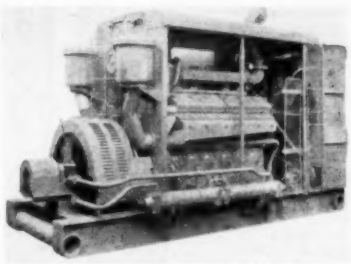
(2) AIR CRANKING MOTOR designed for quick, dependable, low-cost starting of diesel and gasoline engines



is especially well-adapted to use in the oil fields, where natural gas may be used in its operation in place of compressed air. High-pressure gas is reduced to 125 to 150 psi. pressure and piped right into the motor. Can be installed with the same three bolts used for mounting electric starter. *Leece-Neville Co.*

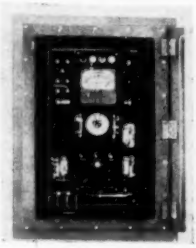
IT'S NEW CHECK IT

(3) PAXMAN PACKAGE UNIT is almost universally adaptable to any type of drilling rig, and, as a complete entity, can be lifted off or replaced on a drilling rig or pumping set without disturbing anything other than the internal-gear-type coupling on the driving end of the shaft where connection is made to either the draw works or mud-pump drive. This self-contained drilling unit comprises engine, hydraulic coupling (fluid flywheel) radiators for water and for lubricating oil, control gear, steel side canopies, starting equipment (either electric, air, or gasoline), all mounted on a sturdy skid-type underbase. *Davey, Paxman & Co., Ltd.*



IT'S NEW CHECK IT

(4) COMBUSTIBLE GAS DETECTOR AND SAFETY CONTROLLER for plant protection has been approved by the Underwriters' Laboratories, and has also received the approval of the Associated Factory Mutual Fire Insurance Co. In operation, it continually samples and analyzes plant atmosphere where combustible gases accumulate. When gas accumulation approaches a dangerous volume, an automatic alarm, both audible and visible, is given and at the same time the controller automatically takes over control of the plant's operating machinery, fire-fighting system, and ventilation system. *Lor-Ann Instrument Co., Inc.*



IT'S NEW CHECK IT

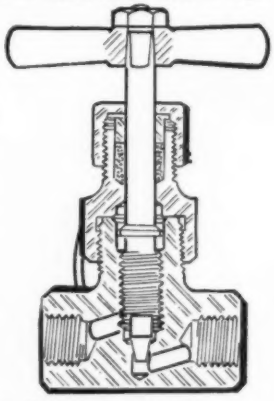
(5) MICHIGAN SPECIFICATION 8700. A new metal filter cloth combines the advantages of very fine particle retention and favorable flow capacity with strength and corrosion-resistant qualities. Present uses include filtering fuel for jet-propulsion engines, for diesel injection fuel systems, and chemical-process filtering. It is highly suitable for applications where fine straining action combined with free-flowing qualities are essential. *Michigan Wire Cloth Co.*

The Oil and Gas Equipment Digest presents a review of what is new in equipment and trade literature . . . makes it possible for readers to obtain full information on every subject by use of convenient "Check It—Mail It" service card. This periodic feature of The Oil and Gas Journal will include all that is new in equipment . . . at a time when new products are being introduced, and existing products improved.

Keep Informed. Save Time. Tear Out Card. Check It. Mail It.

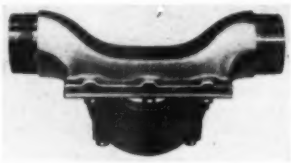
OIL AND GAS EQUIPMENT Digest — IT'S NEW — CHECK IT

(6) BONNET-LESS BAR STOCK NEEDLE VALVE. Unlike conventional units in which stem travel is regulated through valve stem bonnet, valves of this design have no valve bonnets. Stem-travel regulating threads are machined in valve body. By a combination of threads in the various valve parts, no two parts of valve assembly can be unscrewed at the same rate of turn. Faster rate of stem travel is provided by coarser threads. This results in locking stem stop-nut to body of valve proper when both are turned at same rate. Reverse seat is formed and ground on valve stem and in stem stopnut. *Howard Supply Co.*



IT'S NEW CHECK IT

(7) PERMANENT MAGNETIC TRAP for liquid pipe lines has been developed especially for the removal of tramp iron from liquids conveyed in pipe lines. These magnetic traps eliminate tramp iron damage to processing equipment such as pumps, screens, and grinders. They are available in 2, 3, or 4-in. pipe-line sizes and may be ordered with either flanged or threaded ends. Extremely simple in design, it contains no moving parts and consists of a magnetic element and a cast housing. It will accommodate pressures up to 75 psi. Cleaning of tramp iron is accomplished by removing the face plate from the casting, which remains stationary in the pipe line. *Eriez Mfg. Co.*

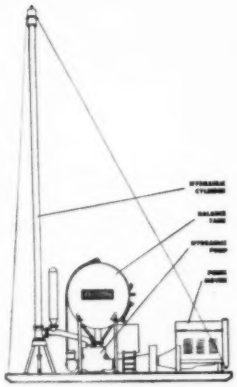


IT'S NEW CHECK IT

(8) TRAILER COACH. This new 33-ft., all-aluminum trailer coach is complete with two bedrooms, bathroom, kitchenette, and living room, as a solution to "on the job" personnel housing problems. The floor plan of this coach makes it readily adaptable to other applications such as field laboratory, work shop, or office. Using the original floor plan as a basis, these latter applications can be custom built to customer specifications. *"M" System Manufacturing Co.*

(9) HEAVY-DUTY LONG-STROKE HYDRAULIC PUMPING JACK. The series "C-P" complements the present series "A" and series "A-P." Designed for extra-heavy duty, the series "C-P" is available in polished-rod load ratings to 40,000 lb., load range ratings to 27,000 lb., stroke lengths to 30 ft., and polished-rod travel to 350 ft. per minute. An unusual feature of the series "C-P" is the use of a spherical balance tank. *Pelton Water Wheel Co.*

IT'S NEW CHECK IT



IT'S NEW CHECK IT

(10) MAGNA-SIGHT, a new rate-of-flow indicator that is equally useful for clear and opaque streams, uses the company's standard Bull's Eye body with a fixed-diameter orifice at its vertical inlet. A tapered plug is suspended in the fluid stream within the orifice. There is a permanent magnet imbedded in the tapered plug which causes an external steel ball to move against a calibrated flow scale when increasing flow rate causes the plug to rise. The rear enclosure is a heavy Herculite glass window which permits visual observation of the fluid. *Fischer & Porter Co.*

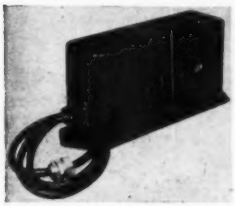
IT'S NEW CHECK IT

(11) CESSNA MODEL 140, a new, all-metal, two-place aircraft providing the necessary speed and range for real utility in cross-country operation. It features an all-metal, semicantilever, high-efficiency tapered wing, and single lift strut. Larger aileron area adds increased aileron control to the inherent stability of high-wing design. Cruising speed is 110 m.p.h. with a top speed of over 125 m.p.h. The new semicantilever, tapered wing smooths out rough air. Increased flap efficiency has improved glide control on all approaches. *Cessna Aircraft Co.*

IT'S NEW CHECK IT

(12) A NEW LINE OF CAPACITORS, specially adapted for oil-field service but equally usable in industrial plants, and suitable for outdoor service, is available in ratings of 2, 3, 4, 5, and 6 kva. at 460 volts. It can be mounted in any convenient position and comes complete,

ready to install, with no extras to buy. Each unit has a 4-ft. flexible flannenol-jacketed cable, including ground wires, with a ¾-in. watertight connector at the end of the cable for knockout connection to the motor starter. If a conduit installation is desired, the connection fitting on the capacitor case may be easily removed and a standard conduit fitting substituted. *General Electric Co.*



IT'S NEW CHECK IT

(13) SEATLESS PISTON VALVES. A radical departure in closure principle is employed in new Strahman valve. A stainless-steel piston sliding into the ring effects positive closure because of long sealing surface. The ring (usually made of laminations of compressed asbestos) is also available in materials suitable for hard-to-hold liquids or gases. The ring itself is easily replaceable. Because metal to metal is eliminated there is no expansion or contraction. The new valve is suitable for low or high temperature range of minus 124° F. to plus 750° F. *Klingerit, Inc.*

IT'S NEW CHECK IT

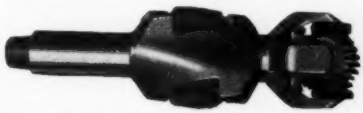
(14) ADJUSTABLE TAPE HANGER, a new tool to measure drill pipe and tubing in strain accurately and quickly, measures 10 in. over-all, weight 1⅜ lb., is made of noncorrosive metals, and is adjustable to fit tubing and tool joints. It has three points of rest which assures perfect seating. Measurements for both drill pipe and tubing can be made with the same tool. All measurements are strain measurements. This eliminates errors due to stretch in the pipe and the buoyance of the well fluids or errors due to the thread makeup of tubing. *Samar Tool Co.*

IT'S NEW CHECK IT

(15) WIDE SLOT SC BALL BEARING TAKE-UP. This unit consists of a deep-groove precision bearing with large balls and retainer to minimize wear enclosed in a rugged, well-designed, outer housing with wide milled slots or ways on each end for supporting guides. The housing has a hole for receiving the unthreaded end of an adjusting screw. *Dodge Manufacturing Corp.*

IT'S NEW CHECK IT

(16) REAMER ROCK BIT makes it possible for drillers to ream and drill in one operation with no need for another round trip to set surface casing. Different types of bit-tooth patterns are available to meet varied top-hole formation conditions. Angular reamer bearing



affords greater stabilization against open hole, giving smoother drilling and longer life to bits. It provides a maximum bearing surface in the hole to remove drill-pipe whip and vibration. Cutters are set at an angle to the vertical and contact over 20 per cent of the circumference of the hole. *Security Engineering Co., Inc.*

IT'S NEW CHECK IT

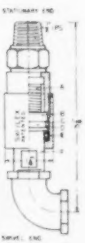
(17) WELDING SADDLES. A 45° outlet reinforcing welding saddle will cut many corners in pipe layouts with savings in space, labor costs, and material. Provides wider reinforcing angle and allows ample space for the heaviest outlet-to-header welds underneath. This 45° saddle is available as a single-piece unit for new installations, and in split form (two halves) for convenient installation where reinforcing is desired on lines already in use. *Pelican Well Tool & Supply Co.*

IT'S NEW CHECK IT

(18) REPAIR SET FOR ROLLER CHAIN to facilitate chain repair. It consists of an anvil, a fork, and a punch. To disassemble the chain, the prongs of the fork are inserted between the side plates of the chain to span the two rollers containing the pins to be removed. The fork and chain are laid in the slot of the anvil where the pins can be removed by striking each one alternately. It is available in sizes to fit any standard roller chain. *Atlas Chain & Manufacturing Co.*

IT'S NEW CHECK IT

(19) SWIVLEX, a new patented swivel joint suitable for 400 psi. maximum pressure and 600° F. maximum temperature. Internal equalizing chamber balances pressures on both sides of swivel seat. All-metal construction eliminates packings, stainless-steel bellows act as seepproof, self-adjusting springs that constantly keep metal-to-metal seat under preadjusted pressure. Automatic internal stop prevents accidental abuse in service. Standard sizes available up to 1-in. inside diameter; larger sizes in preparation. *Seamlex Co., Inc.*



IT'S NEW CHECK IT

TRADE LITERATURE

(20) MARINE ROPES. Specification tables in this 24-page book includes weight and breaking point for each diameter of every type of rope or line manufactured by this maker of wire rope, all types of fiber rope, and nylon rope. *British Ropes, Inc.*

(21) APCO PACKAGED CONDENSATION RETURN UNITS. A 4-page bulletin in two colors, describes Apco Condensation Return Units, both simplex and duplex. Dimension diagrams and selection tables. *Aurora Pump Co.*

(22) THE NEW PRECISION INSTRUMENTATION SYSTEM. This eight-page bulletin, suitable for binding in loose-leaf folder describes the Atcotran, a device for electrically measuring mechanical motions or displacements. *Automatic Temperature Control Co., Inc.*

(23) BALLS AND SEATS. This looseleaf book describes a complete line of oil-well pumping equipment, including sucker-rod sockets, positive-lift traveling valves, and the polished-rod lubricator, among many other items. *Baird Manufacturing Co.*

(24) OIL FIELD APPLICATIONS, a well prepared 20-page book gives descriptions and working drawings of applications for Stoody hard-facing alloys in the oil fields. *Stoody Co.*

(25) UNDERGROUND STEAM DISTRIBUTION contains complete engineering data, including flow charts and tables, route layout, velocities, and the properties of different handing pipe. *Ric-Wil Co.*

(26) NEW MAIN-LINE FITTINGS FOR GAS-TRANSMISSION SYSTEMS discloses a new method of solving some important pipe-line construction problems, involving directional changes and joining differing butt-weld thicknesses. *Taylor Forge & Pipe Works.*

(27) WELD-CAP SPECIFICATIONS is a specification sheet for a complete new line of A.S.A.-type welding caps, including both grades A and B. *Hackney Iron & Steel Co.*

(28) CONSTRUCTIVE POWER. A well-prepared, amply illustrated brochure describes a truck-mounted yard and dock crane capable of raising the boom and lifting and swinging the load simultaneously. *Hanson Clutch & Machinery Co.*

(29) CHAINS FOR OIL-WELL SERVICE. This 14-page catalog gives complete specification data on each design of chain together with suggested applications. *Jeffrey Manufacturing Co.*

IT'S NEW ✓ CHECK IT

(30) NEW IMPROVED SELAS LIQUI-JECTORS describes the operation and applications of this completely automatic and continuous liquid-gas separator. Current price list covering available sizes is also included. *Selas Corporation of America.*

(31) PERMA-SKIN VINYL CORROSION-RESISTANT PROTECTIVE COATINGS. This 4-page folder is a means of combatting corrosion of metal, wood, stone, brick, and concrete structures and equipment. *Dennis Chemical Co.*

(32) SYNCHRONOUS MOTORS. Operating advantages and construction features of bracket bearing synchronous motors in sizes from 30 to 1,000 hp. are described in this new 16-page bulletin. *Allis-Chalmers Mfg. Co.*

(33) BUYERS' GUIDE AND USERS' MANUAL covers a complete line of modern thermocouples and pyrometer supplies. This booklet contains a textbook section giving valuable engineering handbook data on the correct selection and application of thermocouples and protection tubes. *Bristol Co.*

(34) MEASURING AND MIXING EQUIPMENT FOR GAS INDUSTRY. The story of control for measuring and mixing both natural and manufactured gas in public utilities, industrial plants, and municipalities is told in a recently published booklet. *Cutler-Hammer, Inc.*

(35) MONO-TERT-BUTYL-META-CRESOL, a 24-page technical bulletin describing the physical and chemical properties, the uses, and the chemical reactions of the versatile synthetic organic chemical, mono-tert-butyl-meta-cresol. *Koppers Co., Inc.*

(36) MEASUREMENT OF WATER FLOW THROUGH PIPE ORIFICE WITH FREE DISCHARGE. A handy pocket-size booklet explains a meter method of computing water flow. It gives flow graphs for various pipe sizes and explains the method of computation. *Layne & Bowler, Inc.*

(37) RECORDING AND CONTROLLING ROTAMETER. A new bulletin pictures and completely describes this company's line of electronic, electric, and pneumatic recording and controlling rotameters. *Schutte & Koerting Co.*

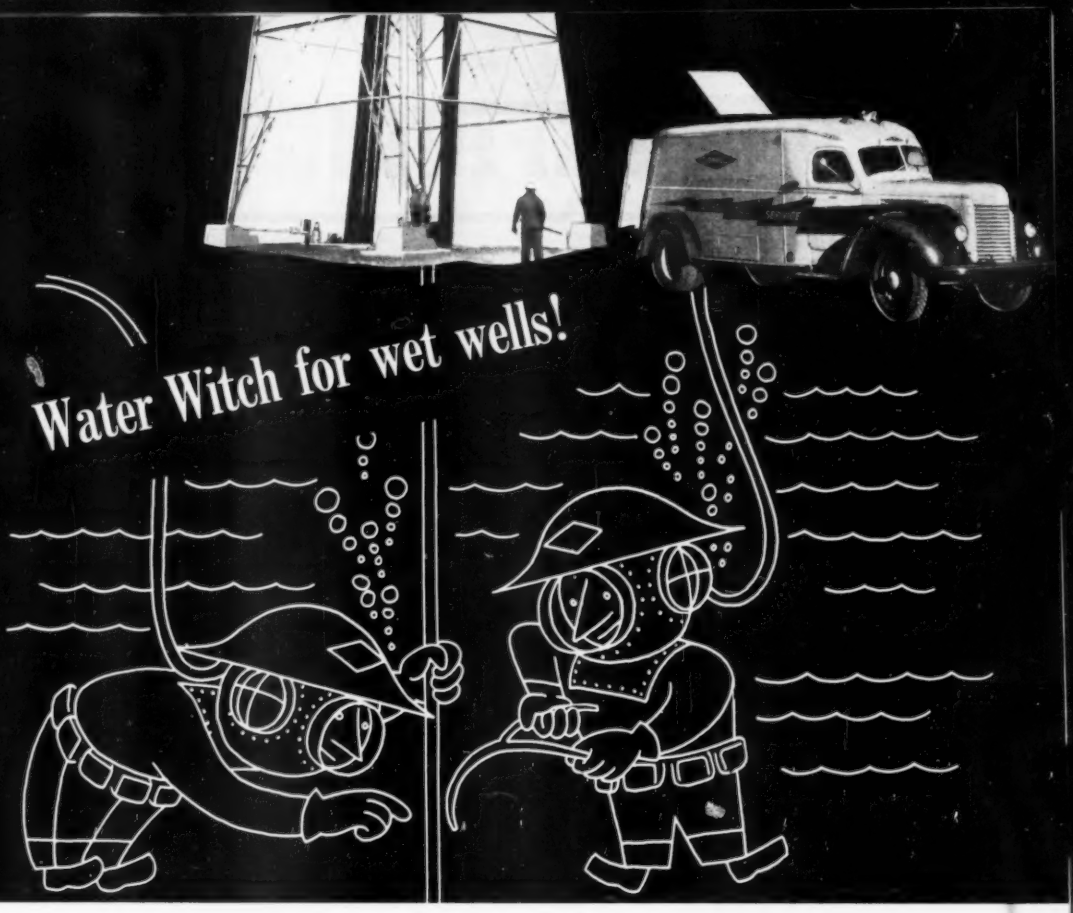
(38) WHY PREFORMED. A new folder giving questions and answers on preformed wire rope, stating questions normally asked about this product and giving the answers. *Macwhyte Co.*

(39) DUAL FUEL DIESELS. A new 8-page illustrated bulletin gives the features of superior dual fuel diesel engines for gas or fuel-oil operation. Three naturally aspirated models with power ratings of 175 to 960 hp. and two turbo-supercharged models with ratings of 505 to 1,400 hp. are covered. *National Supply Co.*

IT'S NEW ✓ CHECK IT

The Oil and Gas Equipment Digest presents a review of what is new in equipment and trade literature . . . makes it possible for readers to obtain full information on every subject by use of convenient "Check It—Mail It" service card. This periodic feature of The Oil and Gas Journal will include all that is new in equipment . . . at a time when new products are being introduced, and existing products improved.

Keep Informed. Save Time. Tear Out Card. Check It. Mail It.



DOWELL WATER LOCATOR SURVEY gave positive and accurate determination of point of water entry

You can best shut off water in a well if you know where the water is coming from. For the location of points of water entry, look to the Dowell Water Locator.

"Water-witching" has been given scientific exactness by the Dowell Water Locator. One of the famous Dowell Electric Pilot Services, the Water Locator uses an electro-chemical reaction to produce surveys which are invaluable in workover and recompletion programs.

After the Water Locator has found points of water entry, Dowell Plastic Service has been used to provide efficient shut-off. This was done in a 3670-foot well which was producing 90% water. A Dowell Water Locator Survey showed the point of water entry at 3652 to 3665 feet. Dowell Plastic was used to plug back to 3631 feet. Result: *100% pipe line oil!*

Ask your nearest Dowell office about the Dowell Water Locator and other Electric Pilot Services.

DOWELL INCORPORATED
TULSA 3, OKLAHOMA
Subsidiary of The Dow Chemical Company

DOWELL
WATER LOCATOR

Ask your nearest Dowell station for complete information on these Dowell services and products: Acidizing, Electric Pilot Services, Plastic Service, Chemical Scale Removal Service for heat exchange equipment, Jelflake, Paraffin Solvents, Magnesium Anodes for corrosion control, and Bulk Inhibited Hydrochloric Acid.

"Petroleum Promotes Progress"

Look to **DOWELL**

FOR OIL INDUSTRY CHEMICAL SERVICE

PENBERTHY
"TRANSPARENT"
DROP FORGED STEEL
LIQUID LEVEL GAGES

Used to observe color and density of liquids under high pressures and/or temperatures. Construction exceptionally sturdy. Made of alloy temperature resisting steel, and are highest quality throughout. Liquid chamber made from solid block of steel to assure perfect alignment and rigidity. Conform with A.P.I.—A.S.M.E. requirements.

The "Transparent" is one of the complete line of Penberthy gages that meet every liquid level gage requirement.

PENBERTHY INJECTOR CO.
DETROIT, MICH.
Canadian Plant
WINDSOR, ONTARIO

FALSTROM
SPECIAL
CUBICLES

. . . and custom-built switchgear housings can be designed for any purpose in any reasonable dimensions. Built-in features include—monitor desks, lighting canopies, rolling doors, streamlined contours, complex internal structures, functional colors, etc.

. . . more cubicle and switchgear ideas are shown in Bulletin 125—write on your letterhead.

FALSTROM
COMPANY
38 Falstrom Court, Passaic, New Jersey
ENGINEERS • DESIGNERS • FABRICATORS SINCE 1870

REFINING

Bakersfield Refinery Work To Be Completed This Year

Modernization and enlargement of Standard Oil Co. of California's Bakersfield refinery, now 20 per cent complete, will be finished by the end of this year, the company has announced, and total expenditures for the construction program will total $7,700,000.

The plant's modernization was begun early in 1948, and is designed to meet the demand for petroleum products in the San Joaquin Valley area. It will increase Standard's output of refined products in this area, and provide a local source of gasoline and oil for parts of the valley now served by the company's refineries at Richmond and El Segundo, Calif.

One of the major units included in the modernization program is a new crude-oil distillation unit which will be finished this summer. This still will replace three batteries of "shell-type" stills which have been the mainstay of the refinery since it was first put into operation in 1912. Completion of the crude-oil unit will help raise the plant's capacity from a rated throughput of 12,000 bbl. of crude oil daily to about 18,000 bbl. daily.

A modern cracking plant, product-treating unit, and a high-pressure boiler plant capable of generating steam at a rate of 70,000 lb. per hour are also being included. New tanks will add more than 200,000 bbl. to the refinery's storage capacity.

Texas Co. Plant Expansion Work Shut Down at Tulsa

The Texas Co. last week authorized a shutdown of expansion work at its West Texas refinery, as a result of a work stoppage by union pipefitters employed by contractors on the project. About 400 of the A.F.L.-affiliated pipefitters quit work a month ago after asking a wage increase of 18¾ cents an hour.

E. M. Reynolds, refinery superintendent, reported the demand for the increased wage would make the construction cost "so prohibitive that the company has authorized an immediate shutdown of the contractors' operations."

Construction work on the multi-million-dollar modernization program at the plant was reported to have reached the point where other craftsmen employed by the contractors could no longer proceed without the work done by the pipefitters. In all, approximately 1,700 persons have been employed on the project.

A. T. Hall, union business representative, said the pipefitters had no dispute with The Texas Co., and added that contractors had national agreements with the pipefitters to pay the prevailing wage scales where they have jobs.

The refinery - modernization program includes installation of a new catalytic cracking unit, new crude-oil pipe stills, a furfural unit, boiler plants, and a polymerization unit. The additions were designed to increase capacity of the plant from 21,000 bbl. to 30,000 bbl. daily.

Socony to Build Four New Catalytic Cracking Units

Four Thermofor catalytic-cracking units of improved design will be built at refineries of Socony-Vacuum Oil Co., Inc., at Trenton, Mich.; Augusta, Kans.; and Beaumont, Tex. The company states that improved design developed by Socony-Vacuum effects substantial reductions in investment and operating costs, and increases flexibility of operation of the unit.

One of the new units will be installed at the Trenton refinery, capacity of which is now rated at 25,000 bbl. daily; one at the 26,500-bbl. daily August refinery; and two at Magnolia Petroleum Co.'s Beaumont plant, which has a capacity of 150,000 bbl. daily. Magnolia is an affiliated company of Socony-Vacuum.

The new units will replace fixed-bed catalytic cracking units which have been in operation for several years. They will have a total throughput of 60,000 bbl. daily, and are expected to be in operation by the end of 1950.

Announcement of the new units signals a resumption in the domestic construction of T.C.C. facilities. Completion of the thirty-eighth domestic unit last month by Socony-Vacuum at Casper, Wyo., marked the first break in a 7-year construction program which saw the installation of nearly 350,000 bbl. per stream day in T.C.C. capacity in the United States.

General to Increase Output Of Gasoline at Refinery

General Petroleum Corp. will increase by 500 bbl. daily production of gasoline at its Torrance, Calif., refinery, since normal fresh-feed capacity of two T.C.C. units has been increased from 6,000 to 7,000 bbl.

daily by installation of an additional furnace in each unit, for higher temperature cracking.

The furnaces have only recently been connected to the units, and their capabilities are still under study, the company reported.

The refinery averaged 104,000 bbl. daily throughput during March and April.

Charge to the reformer unit is being changed from catalytic gas oil to a vacuum tower overhead distillate. This high-boiling range gas oil is heavier than any material which was ever successfully charged to the unit. Considerable interest is centered on the operation and in the properties of the gasoline, which will be produced.

Panther Acquires Location For Plant Near Toronto

TORONTO.—Panther Oil & Grease Co., Fort Worth, Tex., has acquired a site for a Canadian plant at Leaside, near Toronto, and will start operations in August.

Plant equipment and stock, involving an investment of $300,000, will serve Ontario, Quebec, and the Maritime Provinces. It is hoped that later an export trade can be developed to serve British dominions.

The plant will manufacture heavy oils and greases, and asbestos-asphaltic roofing compounds.

INDUSTRIAL
OIL AND GAS
BURNING
EQUIPMENT
AIROIL
NATIONAL
BURNER CO., INC.
1236 East Sedgley Avenue, Philadelphia 34, Pennsylvania
Texas Office: 2512 South Boulevard, Houston 6

"GUNITE" CONCRETE
(SINCE 1915)
LININGS FOR
BUBBLE TOWERS • SETTLERS • STILLS • SEPARATORS • TANKS • AND VESSELS OF ALL TYPES • ENCASING AND FIREPROOFING STRUCTURAL STEEL AND PIPE • LINING WATER RESERVOIRS, DITCHES, DRAINS, AND CANALS • REPAIRING DISINTEGRATED CONCRETE AND OTHER MASONRY.
See our catalog in Sweet's
GUNITE CONCRETE & CONST. CO.
1301 Woodswether Rd., Kansas City 6, Mo.
District Branch Offices
R. N. Turner, Dist. Mgr., 228 No. La Salle St., Chicago 1, Ill. B. H. Mueller, Dist. Mgr., 6625 Delmar Blvd., University City (St. Louis), Mo. Philip D. Barnard, Dist. Mgr., 2036 Addison, Houston 5, Tex.
Branch Offices: Denver, Dallas, New Orleans

N.P.A. Groups Meet At Esso Research Center

Motor-oil trends and the effect of automotive developments on future fuels were discussed last week as members of the National Petroleum Association met at Linden, N. J., for the semiannual field trip sponsored by the association's Department of Standards and Tests, and the Department of Manufacture.

Following an inspection of the laboratories, two members of Standard Oil Development Co. presented papers on future trends in petroleum products. The increasing role of detergents in lubricants was discussed in full by Dr. C. O. Tongberg.

Increasing pressure for octane improvement was predicted by J. F. Kunc, Jr., in covering the fuels field. Diesel fuels will continue to gain in volume demand, with no appreciable changes foreseen in product quality. Jet fuels do not yet pose a serious supply problem, although a Canadian airline is planning shortly to add a jet transport plane on a test basis, and U. S. lines are reported considering the same project.

At the dinner meeting, Dr. F. L. Miller, director of Esso Laboratories, Research Division, spoke on the subject: "Research in the Petroleum Industry."

New Catalytic Cracking Unit Completed at Casper

Standard Oil Co. (Ind.) has announced completion of a new catalytic cracking unit at its Casper, Wyo., refinery.

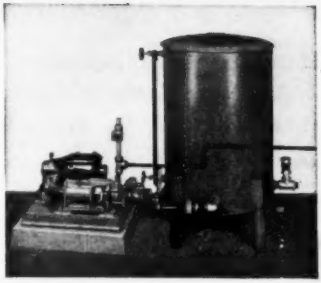
This is the eighth modern catalytic cracking unit to go in operation at the company's refineries during recent modernization and enlargement programs. The units have materially increased gasoline yield and improved gasoline quality, Standard reported.

Jefferson Chemical Moves

Jefferson Chemical Co., Inc., has moved its executive and sales offices to larger quarters at 711 Fifth Avenue, New York City, as a result of expansion of its activities. The company's plant at Port Neches, Tex., manufactures ethylene oxide, ethylene glycol, ethylene dichloride, and other ethylene-based chemicals. It is owned by American Cyanamid Co., and The Texas Co.

Plant Nearing Completion

The new $42,000,000 solvent-refined lube-oil plant, being constructed by Cit-Con Oil Corp. (Cities Service Oil Co. and Continental Oil Co.) adjacent to Cities Service's Lake Charles refinery, is nearing completion, according to latest reports.

MILTON Roy
CHEMICAL PUMPS

Complete Feed Systems for Boiler Water Chemical Treatment
Milton Roy "Packaged" Units for chemically treating boiler water are available to feed sodium sulfite into the suction side of the feed water pump and to feed other chemicals, such as phosphates, soda ash and caustic directly into each boiler. Both methods are usually recommended for the correct treatment of boiler water.
• TO REMOVE DISSOLVED OXYGEN, INSURE AGAINST CORROSION AND PREVENT PITTING.
• TO PREVENT SCALE FORMATIONS, CONTROL ALKALINITY AND PREVENT EMBRITTLEMENT.
Units are complete with Milton Roy Pumps, tanks, gages, low-level pump cutouts and alarms . . . are available in a wide range of capacities to meet all requirements. Complete electronic controls and meters can be supplied to operate pumps automatically at rates directly proportional to feed water flow.
Write for Bulletin 451 also Technical Paper 51 "What the Power Engineer Needs to Know About Chemical Feed Systems for Water Treatment."

MILTON Roy COMPANY

NATURAL GAS

More Gas Wells Needed to Supply Line, Engineer Says

A total of 10 more natural-gas wells will be needed at the Barker Dome gas field in New Mexico in order to serve the San Francisco Bay area and northern Arizona cities, R. A. Graff, president of Graff Engineering & Equipment Co., Dallas, testified before a Federal Power Commission examiner at a hearing in Washington, D. C., on proposed pipe-line facilities to serve the area.

Applications to supply the gas service have been filed by El Paso Natural Gas Co., San Juan Pipe Line Co., and Pacific Gas & Electric Co.

Graff testified the wells are needed in order for the line to serve the two areas with 165,000,000 cu. ft. of gas from the San Juan Basin in Colorado, New Mexico, and Arizona. The proposed line would be 451 miles in length and would be constructed by El Paso Natural. It would cross the Arizona - California border near Needles, Calif.

El Paso has contracted to purchase 100,000,000 cu. ft. of gas daily from Delhi Oil Corp., Graff said. The gas is to be taken from the Barker Dome field.

In order to make this quantity of gas available, the 10 additional wells, costing $200,000 each, must be drilled. Other necessary investments, he said, would bring total cost to $6,582,339.

Chicago Firm Asks Approval Of Big Storage Project

WASHINGTON.—The Chicago District Pipeline Co. last week asked the Federal Power Commission to approve a $6,000,000 project for storage of natural gas in liquid form in warm weather for use in the Chicago area during period of peak winter demand.

The company proposes to erect a plant in Chicago for the liquefaction, storage and regasification of natural gas, with facilities for liquefying approximately 4,000 M.c.f. of gas daily and for regasification and return to the transmission system of 6,000 M.c.f. an hour, and with a storage capacity of 400,000 M.c.f. of gas.

The liquefaction process planned by the company involves separation and recovery of butane and propane, removal of nitrogen, and storage of the gas in liquid form at a temperature below boiling point.

The company proposes to offer the storage facilities to its customer companies under a rate schedule based on the cost of service. Construction of the plant would be financed through a loan from its parent company, The Peoples Gas Light & Coke Co.

Canadian Gas Meet June 16 To Feature Full Program

A well-rounded program, dealing with all phases of the gas industry, will be featured at the forty-second annual convention of Canadian Gas Association, which meets at Bigwin Inn., Lake of Bays, Muskoka, Ont., June 16-20. Registration will begin June 16, and sessions will get under way on June 17.

Among papers to be presented at the meeting are those dealing with losses in gas, radio communication, and methods of sale. The complete program follows:

June 17: First general session, Alex MacKenzie, president, Canadian Gas Association, Toronto, chairman. "Canada and the Gas Industry," by T. Pates Pinckard, vice president and general manager, United Gas & Fuel Co. of Hamilton, Ltd., Hamilton, Ont.; "The High B.t.u. Oil-Gas Plant, Port Stanley, Ontario," by H. E. Merrill, chief engineer, Dominion Natural Gas Co., Ltd., Buffalo, N. Y.; "Catalytic Reforming and Thermal Cracking," by Edwin L. Hall, director, testing laboratories, American Gas Association, Cleveland; "How to Account for Your Unaccounted For Gas," by Milton W. Heath, president, Heath Tree Service, Inc., Wellesley, Mass.

June 18: "F.M. Radio Communication," by W. L. Dutton, operations engineer, Union Gas Co. of Canada, Ltd., Chatham, Ont.; "Things May Be Changing Now," by C. George Segeler, utilization engineer, American Gas Association, New York City; "Dealer Cooperation—A Problem of Synthesis," by H. D. Valentine, sales promotion manager, Peoples Gas, Light & Coke Co., Chicago; "After the Sale—What?" by Miss Byrne Hope Sanders, editor, Chatelaine Magazine, Toronto; "Significance of Recent Oil Discoveries in Alberta," by Dr. Oliver B. Hopkins, vice president, Imperial Oil, Ltd., Toronto.

Hearing June 14 by FPC on Atlantic Seaboard Proposal

Hearing will begin June 14 in Washington, D. C., by Federal Power Commission on proposal of Atlantic Seaboard Corp. to sell and deliver natural gas to Consolidated Gas Electric Light & Power Co. of Baltimore, and to install measuring and regulating stations to measure the gas proposed for delivery to the Baltimore firm.

Atlantic Seaboard, subsidiary of Columbia Gas System, Inc., proposes to construct not more than five measuring and regulating stations at an estimated cost of $181,000. The firm says it can meet the needs of Consolidated without impairing service to its other customers upon receipt of gas which it expects will be made available to the Columbia System by Tennessee Gas Transmission Co., Texas Eastern Transmission Corp., and Texas Gas Transmission Corp.

Tennessee Gas Plans Hike In Capacity of Big Line

Tennessee Gas Transmission Co., which operates a natural-gas line from Texas to West Virginia, is planning on increasing capacity of the line to more than 1,000,000,000 cu. ft. daily, Gardiner Symonds, president, announced.

The company announced a registration statement covering an offering of $50,000,000 in bonds had been filed with Securities and Exchange Commission as the first step in the expansion. The securities are first mortgage bonds, due in 1969 and the proceeds will be a part of the $90,000,000 which ultimately will be required to increase present capacity, and also to extend the line to the Buffalo, N. Y., area.

The system has a present daily capacity of 615,000,000 cu. ft.

Firm Asks Loan Permit

National Fuel Gas Co. has asked SEC for authority to borrow $5,000,000 from Chase National Bank, New York, to purchase shares of Iroquois Gas Corp. and United Natural Gas Co. Iroquois and United will use their funds for construction and gas-storage programs.

Natural Gasoline

New Pettus Cycling Plant Will Operate This Month

The new cycling plant near Pettus, Tex., will be in operation some time during June, A. C. Andrews, plant supervisor for Stanolind Oil & Gas Co., operator, reported. Everything is in order, and the plant only has to be hooked up and the insulation completed, he said.

Started in 1948, the plant will have a daily capacity of approximately 160,000,000 cu. ft. of gas. A total of 70 miles of pipe line, most of it high-pressure line, will be used to take the gas to and from the Bee County plant, which will serve the North Pettus and Burnell oil fields in Bee, Karnes, and Goliad counties.

Stanolind will operate the plant, and Union Producing Co. will be the unit field operator. The plant will produce 287,000 gal. daily of liquid products, including gasoline, butane - propane, and kerosine and diesel fuel.

Put more opportunity into your company's future

WITH THIS FIVE-STEP PROGRAM

Here's an easy-to-follow program that will substantially increase your company's chances for a prosperous future.

Nation-wide experience in 20,000 companies proves that this popular program also pays off handsomely *today*. It increases each participating employee's peace of mind—making him a more contented, more productive worker. It reduces absenteeism, lowers accident rates, increases output, and improves employee-employer relations!

This program is simply a proved formula for building membership in the Payroll Savings Plan—the "automatic" system by which millions of workers are investing in U. S. Savings Bonds every pay-day.

What Are the Five Steps?

The benefits of the Payroll Savings Plan to your company are in proportion to the percentage of employees who participate. Nation-wide experience indicates that 50% of your employees can be persuaded to join *without high-pressure selling*. Here are five steps which have proved to be the "magic formula" for putting over the Plan. They will get results for you:

1. See that a top management man sponsors the Plan.
2. Secure the help of the employee organizations in promoting it.
3. Adequately use posters and leaflets and run stories and editorials in company publications to inform employees of the Plan's benefits to them.
4. Make a person-to-person canvass, once a year, to sign up participants.

These first four steps should win you 40-60% participation. Normal employee turnover necessitates one more step:

5. Urge each new employee, at the time he is hired, to sign up.

Check up on the Payroll Savings Plan in your company. If fewer than half of your employees are participating, you have a lot to gain by following the five-step program outlined here. All the help you need is available from your State Director, U. S. Treasury Department, Savings Bond Division. While it's on your mind, why not call him right now? Or write the Treasury Department, Washington 25, D. C.

Are You With It?

In the current national Savings Bonds campaign, May 16-June 30, the Treasury Department asks each company operating the Payroll Savings Plan to canvass all employees, with the goal of having at least half of them signed up by the end of the month. This advertisement tells how you can achieve that goal most easily.

The Treasury Department acknowledges with appreciation the publication of this message by

THE OIL AND GAS JOURNAL
TULSA 1, OKLAHOMA

This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and The Advertising Council.

CRC
PIPE LINE CONSTRUCTION EQUIPMENT
CRUTCHER-ROLFS-CUMMINGS, INC.
Pipe Line Equipment and Materials
Houston - Tulsa

TO REPAIR PIPE LEAKS—
QUICKLY, PERMANENTLY
ANY PRESSURE — ANY TEMPERATURE

SKINNER-SEAL EMERGENCY PIPE CLAMP
for pinhole or corrosion leaks.

SKINNER-SEAL PIPE LINE CLAMP for
long splits and bad corrosion leaks.
In stock—all oil well supply stores
M. B. SKINNER COMPANY
SOUTH BEND 21, INDIANA, U. S. A.

PIPE LINES

Outside X-Ray Inspection Near Welding Operations

Outside X-ray inspection of welding is supplementing internal X-ray inspection during pipe-line construction.

The photograph on this page shows outside X-ray inspection applied by Industrial X-ray Engineers for the Atlantic Seaboard Corp. and Virginia Transmission Corp. in the mountainous country near Elkins, W. Va., where it was difficult to reach the welds to be inspected by an internal X-ray machine. The external method also has the advantage of making it possible to inspect welds radiographically close to where welding operations are actually in progress.

The outside method has the disadvantage of requiring longer exposure time. For most X-ray welding inspection work, the internal method is preferable because of the speed with which it may be manipulated in country which is not too rough and because of the shorter exposure time required. The external method requires time twice as long as the internal method, furthermore since the outside exposures are made in three segments, three times as many exposures are made as for the internal method with a single circumferential exposure.

Construction to Start Near Baltimore, Md.

Operations for building the $22,000,000 268-mile, 26-in. line of Atlantic Seaboard Corp. and Virginia Gas Transmission Corp. will be accelerated by the addition of a spread under R. K. Shivel now being moved from Texas-Empire Pipe Line Co. work completed near Champaign, Ill. This spread is going to Rockville, Md., near Baltimore, where it will lay 68 miles from Rockville to Strasburg, Va.

West of Strasburg, H. C. Price Co. is laying 122 miles for the same project with two additional spreads. One under W. B. Williams has field office at Elkins, W. Va.; the other is under Charles Ice at Petersburg, W. Va. The eastern section of 78 miles in the Clendenin, W. Va., area is being built by Ray L. Smith & Son, Inc. Operations are under Joseph L. Work, superintendent, and William Frost, spread man. Smith operations are based at Clendenin.

Texas-Empire Completes 60-Mile Illinois Section

In the construction of Texas-Empire Pipe Line Co.'s 183-mile, 18-in. crude-oil line from Patoka to Wilmington, Ill., H. C. Price Co. has already completed a 60-mile section in a remarkably short period which represents progress at an average rate of 2 miles per day.

This 60-mile section in the Gibson-Bethany, Ill., area was built by the Price spread with operations based at Champaign, Ill., under the supervision of R. K. Shivel, superintendent. Ray Stokes was office manager.

The remainder of the Texas-Empire project consisting of 125 miles contracted by Anderson Brothers Construction Co., Bechtel Corp., and Conyes Construction Co., is approximately 60 per cent completed.

Outside method of X-ray inspection of welding near Elkins, W. Va., on the project of Atlantic Seaboard Corp. and Virginia Gas Transmission Corp. at a section contracted by H. C. Price Co.

IT'S THE PROTECTION YOU *Can't* SEE THAT COUNTS

You can't take pipe protection for granted just because the outer wrapping looks good.

It's the quality of the application of the protection underneath the outside wrapper that is the true yardstick of enduring pipe protection.

When you turn the job over to Pipe Line Service, you never have to worry about the quality of protection. You get the benefit of long experience and skill in cleaning, priming, coating and wrapping. There is no division of responsibility—no chance for a slip-up. You can be sure the job will be right, from start to finish.

Six strategically located plants provide complete facilities to take the headaches out of pipe protection for pipe users on gathering, transmission and distribution lines.

Write for details

PIPE LINE SERVICE CORPORATION

Pioneers in Steel Pipe Protection...Since 1931

General Offices and Plant: Franklin Park, Ill.

Plants at: Glenwillard, Pa. • Longview, Texas
Corpus Christi, Texas • Harvey, La.
Sparrows Point, Md.

San Juan Basin Outlet To Operate in 1950

The 451-mile, 24-in., Farmington, N. M.-Topock, Ariz., line could be completed before November 1, 1950, according to C. C. Cragin, vice president and general manager of El Paso Natural Gas Co. which is planning to build the project for transmitting gas to the Pacific Gas & Electric Co. line now being built from Topock to the San Francisco area. The 1950 completion date mentioned by Cragin in testifying before the Federal Power Commission means that the San Juan basin outlet would be built earlier than contemplated in previous schedules which called for completion in 1951.

The steel could be bought in Houston, said Cragin, and the pipe made at the Republic Steel Co. plant at Gadsden, Ala.

A. Faison Dixon, New York engineer and geologist, testifying as to reserves in the San Juan basin, said there is sufficient gas in the Barker Dome to produce 125,000,000 cu. ft. of pipe-line gas a day for 20 years. *(See related story on page 110.)*

William E. Denson, representing the Atomic Energy Commission, said there must be sufficient gas to meet the needs of the atomic plant at Los Alamos, N. M., for 25 years. He said "we'll need 90,000,000,000 cu. ft." The Atomic Energy plant now gets its gas from Barker Dome.

John W. Metzger, Colorado attorney general, asked that the FPC rule that Colorado "be given the same right over exported gas as our supplier states have over imported gas." He said Colorado's "basic and prior right to and in her mineral resources must be recognized."

Transcontinental's Final Cost to Be $235,000,000

Trancontinental Gas Pipe Line Corp. expects to make initial delivery at New York City by September 1950, according to Claude A. Williams, president. Final completion of the 1,840-mile trunk line for transmitting gas from the Rio Grande Valley of Texas to 132nd Street, New York City, is scheduled for 1951.

As originally planned the project, estimated to cost $190,000,000 for delivering 340,000,000 cu. ft. daily, may be expanded to provide for 505,000,000 cu. ft. capacity. Final cost has been estimated by Williams as $235,000,000.

In 1949 Transcontinental will build 605 miles of 30-in. between Eunice, La., and Athens, Ga. In 1950 the Athens-New York City section and the Eunice-Rio Grande Valley sections will be under construction.

Natural-gas reserves in the Gulf Coast region traversed by the project

"Everything for the Pipeliner"

PIPE COATING and WRAPPING MACHINES
Stationary and Line Traveling

•

PIPE CLEANING and PRIMING MACHINES
Stationary and Line Traveling

•

American Steel Works
HEATING KETTLES

•

PIPE LINE SUPPLIES AND EQUIPMENT

PERRAULT *Brothers* INC.
1130 NORTH BOSTON
TULSA 6, OKLAHOMA
Phone 5-1104

1369 MILES

During our fiscal year, ending Nov. 30, 1948, five spreads of Latex Construction Company laid and took up a grand total of 1369* miles of pipe. This imposing mileage of pipe line work was divided as follows:

Miles of Pipe laid, 16" and larger.....588
Miles of Pipe laid, 8", 10" and 12"...379
Miles of Pipe taken-up and reconditioned..402

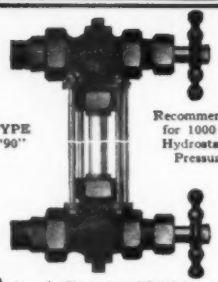
*This figure does not include the mileage under contract at the end of 1948, to be completed during 1949, amounting to 181 miles.

Latex CONSTRUCTION COMPANY
General Contractors
Oil-Gas-Gasoline-Water Pipelines
HOUSTON, TEXAS ATLANTA, GA.
L. H. Favrot — G. A. Peterkin —
J. W. Sharman — R. P. Gregory

PENBERTHY

DROP FORGED STEEL

LIQUID LEVEL GAGES



TYPE "90"

Recommended for 1000 lb Hydrostatic Pressure

Made of Chromium-Molybdenum alloy temperature resisting steel, extra heavy throughout and stainless steel trimmed. Positive automatic shut-off; stainless steel balls shut off the flow of liquid if glass breaks. Regrinding removable seats, heavy duty stuffing boxes, union connections. Conform with A.P.I.—A.S.M.E. requirements.

This is one of the complete line of Penberthy gages that meet every liquid level gage requirement.

PENBERTHY INJECTOR CO.

DETROIT, MICH. Canadian Plant WINDSOR, ONTARIO

Cut & Bevel Any Pipe

With

Maximum SPEED

Minimum COST

The H & M PIPE CUTTING and BEVELING MACHINE for 2 to 36-in. pipe

SPEED: Complete cut and bevel can be made on 12 inch pipe in about 2 minutes.

ECONOMY: Save approximately one-half labor and gas costs.

PORTABILITY: Can easily be carried from one pipe section to another.

Write for Literature and new, lower prices. Out Of Rounds attachment fits all machines.

The H & M

Pipe Beveling Machine Co.

311 East Third Street, Tulsa, Oklahoma

have been estimated to be more than 50 trillion cubic feet.

Senior financing for the Transcontinental Gas Pipe Line Corp. was completed June 3 when 18 insurance companies delivered checks aggregating $143,000,000 in payment for the company's first-mortgage pipeline bonds, 3⅝ per cent series due 1968.

Claude A. Williams, president of Transcontinental, and John F. Burton, vice president and treasurer, received the proceeds of the bond sale at the official closing which took place at the trust department of the Chase National Bank.

The largest check turned over to the company was the Metropolitan Life Insurance Co.'s $70,000,000. Other large participants in the issue were New York Life Insurance Co., $25,000,000, and Mutual Life Insurance Co. of New York, $15,000,000.

Macco Corp. Buys Signal Pipe-Line Construction Co.

Signal Pipe Line Corp., subsidiary of the Macco Corp., has purchased Signal Pipe Line Construction Co.

B. M. Laulhere will head the new Signal Pipe Line Corp. as vice president and general manager.

Of the three partners operating the predecessor company — James Kitt, Jack Robertson, and L. L. Bendinger, only the latter continues with the new management in the capacity of office manager and assistant secretary.

Other officers are: John MacLeod, president; F. E. Cornwall, vice president; Fred H. Brown, vice president and treasurer; and W. B. von Kleinsmid, secretary. These officers hold similar offices in Macco Corp.

Oklahoma Natural Gas to Recondition 64-Mile Line

Oklahoma Natural Gas Co., has awarded contracts for the reconditioning of 64.8 miles of 12-in. gas line from a point near Blanchard to Stroud, Okla., according to an announcement by Joseph Bowes, president. Work will start around June 15.

The pipe line, known as A-1,000, which normally operates at a pressure of 1,000 psi., will be removed, cleaned, reconditioned, rewelded, coated, and replaced at a cost of over $1,000,000.

The reconditioning of the line will make an additional 15,000,000 cu. ft. of natural gas available to domestic, commercial, and industrial users in eastern Oklahoma.

Trojan Construction Co. of Oklahoma City has the contract for taking up the line, cleaning it, and hauling it to Oklahoma City, and for relaying it.

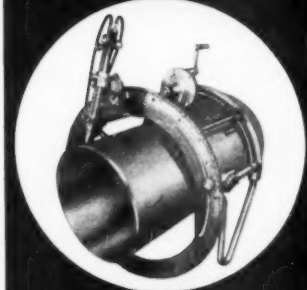
Black, Sivalls & Bryson has the contract for the rewelding of the line.

CROSE

PIPE CUTTING AND BEVELING MACHINE

EQUIPPED WITH OUT-OF-ROUND ATTACHMENT

Machines to cut and bevel 16" pipe and over are furnished with out-of-round attachment.



EQUIPPED WITH STANDARD TORCH HOLDER

Machines to cut and bevel 14" pipe and under are furnished with Standard Torch Holder.

Crose pipe cutting and beveling machines are sturdy light weight construction made from cast aluminum. Simple operation. This machine has a split ring which enables it to be installed over the pipe for cut outs. The out-of-round cutting attachment allows you to cut true bevels on bent or egged pipe. Machines to cut and bevel pipe up to and including 36 inches in diameter are available for immediate delivery.

WRITE FOR BULLETIN BM1001

M. J.

CROSE

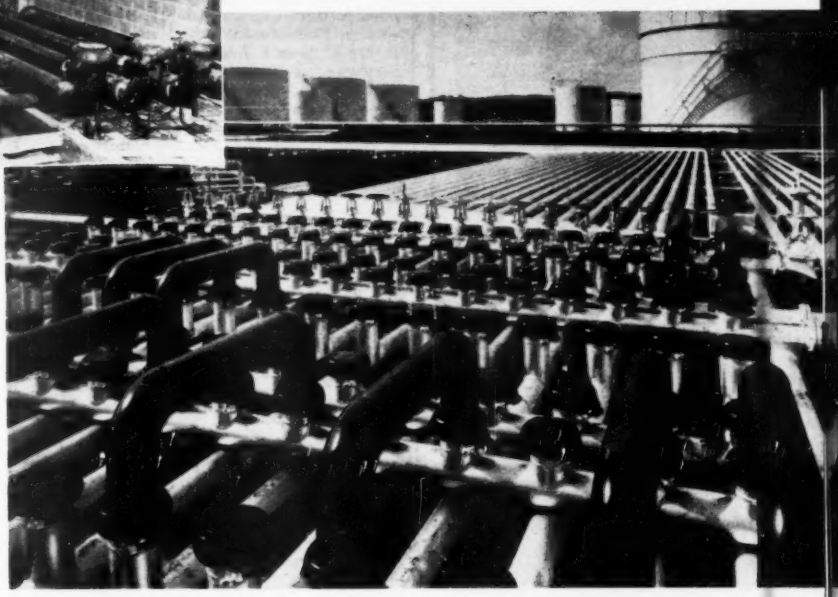
MANUFACTURING CO., INC.

2715 Dawson Rd. Tulsa, Okla.

M & M Building Houston, Tex.

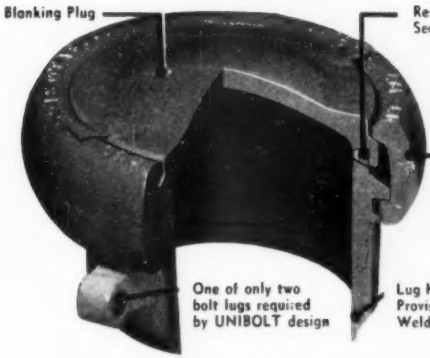
THIS "*TRIAL*" INSTALLATION QUICKLY LED TO COMPLETE STANDARDIZATION ON

UNIBOLT PIPELINE TERMINAL FITTINGS



Top—Original installation in 1945.

Right—Latest installation in 1947.


Blanking Plug
Resilient Seal Ring
Nut, or Holding Member
One of only two bolt lugs required by UNIBOLT design
Lug Hub—Provisioned For Welding To Pipe

The above cut-away view of a UNIBOLT Pipeline Terminal Fitting illustrates its simple yet unique design. Tapered interlocking shelves on the lug hub and holding members are drawn together by means of only two bolts to apply tremendous pressure on the seal ring.

When this major products pipeline operator selected UNIBOLT Pipeline Couplings With Blanking Plugs to replace gate valves on products line terminals, he accomplished a two-fold improvement in the manifold: First, and most important, all danger of contamination resulting from one product leaking past the gate into a line carrying a different product, due to mechanical failure or human error, was eliminated. Second, the manifold was greatly simplified, due to the elimination of a large number of gate valves.

Pipeliners are invited to write for UNIBOLT Bulletin PL-490, which illustrates a number of time, labor and cost saving applications of UNIBOLT products.

THORNHILL-CRAVER CO.

HOUSTON, TEXAS

PENBERTHY
"REFLEX"
WATER GAGE SET

For oil field, locomotive type and marine boilers. Water shows black — steam shows white; the water level is unmistakable. U-Bolt construction is strongest and simplest to service. Glass replaced by simply removing nuts on face of gage . . . unnecessary to work between gage and boiler. Conforms with A.S.M.E., Federal and State requirements when used for pressures specified by their respective codes.

This is one of the complete line of Penberthy gages that meet every liquid level gage requirement.

PENBERTHY INJECTOR CO.
DETROIT, MICH. Canadian Plant WINDSOR, ONTARIO

USE 'BESTOLIFE
IT'S BETTER

'BESTOLIFE—the Lead Seal Joint Compound used successfully in the Drilling and Refining Industries for years — is immediately available through more than 100 distributors in the U.S.A.

Your nearest supply house field store probably has 'BESTOLIFE in stock for immediate delivery. Use 'BESTOLIFE — It's BETTER!

EXPORT: THE NATIONAL SUPPLY CORP.,
30 ROCKEFELLER PLAZA, NEW YORK

I. H. GRANCELL
1001 EAST MARIAN STREET
LOS ANGELES 1, CALIFORNIA

Among the Drilling Contractors

Olson to Drill Deep Test In Virgin New Mexico Area

Olson Drilling Co., Tulsa, is completing arrangement to drill a deep test for Apache Oil Corp., Houston, on the Hernandez Creek structure in northeastern Chavez County, southeastern New Mexico. The location, in 18-27e-4s, is in a virgin area, 45 miles northeast of Roswell and 75 miles north of fields in Eddy and Lea counties. Present plans call for drilling to 6,000 ft., but a rig capable of going to 8,500 ft., or the granite, will be used to permit drilling to the lower level if findings justify it.

Drilling Company Moves

Skinner & McDougal Drilling Co., which for the past 2 years has operated out of Oklahoma City, has reestablished its headquarters at Evansville, Ind. Frank Skinner, one of the co-owners, is located at Evansville, while William McDougal will be at Salem, Ill. The company operates cable tool rigs and well completion units.

Drilling Company Formed

Formation of the Dickerson Drilling Co. with offices at Evansville, Ind., and Henderson, Ky., has been announced by William Dickerson and Jack C. West, Michigan City, Ind., coowners. Operations are being initiated with one rotary power rig.

Cain Joins Hayes Drilling

James Cain, formerly associated with the Atlas Drilling Co. in the Illinois basin, has joined Hayes Drilling Co. as toolpusher at Mount Carmel, Ill.

Viersen & Cochran, Oklahoma City, has contracted with Cities Service Oil Co. to drill a 12,500-ft. test on the Petree ranch in 18-11n-8w, Canadian County, Oklahoma. The location is in a wildcat area.

Northern Development Co., Ltd., Lloydminster, Saskatchewan Province, is the contractor for A. G. Bailey Co. and Michel Oils, Ltd., on a wildcat test to be drilled in LSD 13, 4-38-14w4, 120 miles northeast of Calgary, Alta., Canada.

ROTARY RIGS IN OPERATION*
(United States and Western Canada)

Area—	Week ended 5-30-49	Change week ended 5-23-49	Change week ended 5-24-48
Gulf Coast	585	+45	+59
W. Tex.-N. Mex.	543	+ 9	—28
Ark.-N. La.-E. Tex.	168	+15	+ 5
Oklahoma	241	—20	—48
Kansas	114	— 4	—30
Illinois-Eastern	126	—15	+11
Rocky Mountains	111	+ 3	—40
Pacific Coast	198	+24	+28
Total U. S.	2,086	+57	—43
Western Canada	79	0	+40
Total	2,165	+57	— 3

*Courtesy Hughes Tool Co.

Production Service Co., Houston, is operating a workover rig for Skelly Oil Co. in the Sugar Valley field, Matagorda County, Texas Gulf Coast. Members of the crew, left to right, are: W. H. Dreher, derrickman; G. W. McAdams, driller; Roy Evans and F. W. Dreher, floormen

Teepee Drilling Co., Britton, Okla., is starting two additional tests in the Lexington area, southern Cleveland County, Oklahoma, where it is opening a new pool in its 1 Warner, C SE NE 4-6n-1w. One of the new tests is a 40-acre east offset to the discovery well. The other is a half mile southwest. Depth of the discovery well is 6,555 ft.

Longer Thread Life
WITH
Jimmie Gray
COMPOUNDS

KANT-GALL TOOL JOINT COMPOUNDS

EXCLUSIVE 500-TON SPECIAL

LONG-LIFE DRILL COLLAR COMPOUND

You can always break the joint when you use Jimmie Gray Compounds! That's because each one is engineered to do certain specified jobs best! You can depend on their thread-protecting film to prevent galling and washouts, too. Satisfaction is assured thru the famous Jimmie Gray money-back guarantee!

SOLD BY SUPPLY STORES EVERYWHERE

FORMERLY STANDARD OIL SALES CO.

PETROLEUM DISTRIBUTING CO.
BOX 203—HOUSTON, TEXAS
CHarter 4-5648

Derricks
Drilling Masts
Drilling Barges
Flood Lighting

RIG-A-LITE
Reg. U. S. Pat. Off.
"PERFECTED DERRICK LIGHTING EQUIPMENT"
2507 Smith St. P. O. Box 6087
HOUSTON, TEXAS

Bateman Drilling Co. New Orleans

With E. G. Bateman as sole owner, Bateman Drilling Co. had its inception in 1930, starting with one small rig operating in the East Texas field. It now has four large steam-powered rotary rigs and maintains headquarters in the Canal Building, New Orleans.

Operations.—Present operations are concentrated in southeastern Louisiana, where one rig is drilling for Humble Oil & Refining Co., another for The Texas Co., and two for its own account in partnership with Callery & Hurt. The company owns a half interest with F. A. Callery in 2,000 acres in the West Barataria field, Jefferson Parish, on which seven producing wells have been completed with current production totaling 1,500 bbl. daily.

Personnel.—Drilling superintendents are: Ray Walker, Harvey, La., who has been with the company 17 years; Hugh F. Lambert, New Iberia, La., with the company 6 years; and J. E. David, Golden Meadow, La., with 4 years' service. John J. Metzger, Jr., is production superintendent, with headquarters at New Orleans. D. Todd Briggs is office manager at New Orleans.

Midwest Drilling Co., a newly formed firm with headquarters at Calgary, Alta., Canada, is starting its first contract job, a wildcat being drilled for the Golden-Spike-Steveville group in the Steveville area, 100 miles east of Calgary.

Mark Fleming, cable tool contractor, Bridgeport, Ill., is drilling a wildcat test for Illinois Mid-Continent Co. southwest of the Veale pool in Daviess County, Indiana.

Robinson-Matheny Drilling Co., Wichita Falls, Tex., will drill McColl-Frontenac Oil Co.'s second wildcat test in the Spotted Creek area, 35 miles northwest of Canadian Gulf Oil Co.'s new oil discovery at Stettler, Alta., Canada.

Loffland Brothers Co., Tulsa, has been awarded contract to drill a wildcat test for Barnsdall Oil Co., Honolulu Oil Co., and Seaboard Oil Corp. in the Smoky Lake area, 55 miles northeast of Edmonton, Alta., Canada.

Since 1919
HINDERLITER
TUBING HEADS
CASING HEADS
CHRISTMAS TREES
TOOL JOINTS
HINDERLITER TOOL CO., DIV.
H. K. PORTER COMPANY, INC.
TULSA 1, OKLAHOMA

"YOU . . . . TOO!"

Oil men have a gratified grin on their faces when they find how a Mayes-Bevan preliminary exploration survey can be so helpful, and SO ECONOMICAL! A Mayes-Bevan Gravity Meter Survey simply takes a huge potential oil province and "knocks it down to size" by spotting the limited areas in which further, detailed exploration should be profitable. There's no question of engaging high cost exploratory methods over a large area when a Mayes-Bevan Gravity Meter Survey points out the sharply restricted sectors in which more costly and elaborate exploration should pay off. Experienced field work, plus skilled interpretation by practiced Mayes-Bevan technicians, give you dependable exploratory data at the lowest cost.

KENNEDY BLDG. MAYES-BEVAN GRAVITY METER SURVEYS COMPANY TULSA, OKLAHOMA

Exploration and Drilling

100 Million Acres in Canadian Land Play

WE are now nearing the closing phase of the primary stage of what is perhaps the greatest land play ever made by oil men on the North American continent; just possibly the greatest play ever made in the Western Hemisphere.

From northeast British Columbia, through Alberta, Saskatchewan, and into southwest Manitoba, at least 100 million acres are now under some form of exploration permit or lease. Geologically most of it is in the great Canadian geosyncline or Alberta trough, lying between the Rocky Mountains on the west and the pre-Cambrian granite Canadian Shield on the east and north. In addition to the Canadian acreage, and geologically part of the same land play, a minimum of 5 to 10 million acres (possibly considerably more by this time) in the Williston basin and Lemmon syncline of North and South Dakota is under lease.

An approximate geographic division of the Canadian acreage is: northeast British Columbia, 3 million acres; Alberta, 55 million acres; Saskatchewan, 38 million acres, southwest Manitoba, 4 million acres.

It is difficult to set an initial date for the exact beginning of this enormous play, which involves scores of oil companies and hundreds of individuals. But while there was a large amount of acreage under permit in Alberta prior to the discovery of the Leduc field in February 1947, certainly the big expansion was set off by that strike.

There have been numerous instances where one large company, or a group of companies acting jointly, have obtained concessions on very large areas from the national government of some country. In some cases, other large companies have followed the first group, and also obtained large concessions. But this has been a different kind of a play. Hundreds of the little fellows, and scores of small independent companies, as well as practically every major oil company, are in on this plan. There are individual Canadians and individual Americans; Canadian independent operators and American independent operators; major Canadian operators and major American operators; and they all have acquired some kind of a stake in the play.

The play has proven that Canadian politicians, like their citizens, are practical and realistic when faced with facts. As recently as 1946 one of Canada's largest operators pulled out of Saskatchewan, insofar as dealing with mineral rights owned by the province was concerned, because of political threats of nationalization or socialization of oil properties. After watching the results of the policies of the Alberta government, and the prosperity that followed, the leaders of Saskatchewan's socialist government changed their minds. Assurances were given that there would be no expropriation and that private capital would be encouraged to explore for oil and gas on fair terms for both the companies and the people of Saskatchewan.

As a result, of the 38 odd million acres taken up in Saskatchewan, over 26 million are on mineral rights owned by the province, and the bulk has been taken since February 1949. This is just about all of the land controlled by the provincial government within areas that are accessible and geologically possible. The larger blocks of "freehold lands" (minerals owned by private individuals or corporations) have been taken up. There remain the substantial but scattered acreages controlled by small landowners, and these are being worked intensively right now. One American company is reported to have 22 land men in the area.

The secondary stage of the land play is just getting well under way. Individual permit holders, and smaller companies with more acreage than they can handle alone, are making various deals with latecomers and with larger companies with financial resources to handle the geophysical, geological, and drilling expenditures that will be required to validate the permits.

HIGHLIGHTS OF WEEK'S DEVELOPMENTS

ROCKY MOUNTAIN AREA.—Interest of Rocky Mountain operators is now centered on the Denver Basin, with Ohio Oil Co. testing its 1 Egging, Cheyenne County, Nebraska, wildcat. The California Co. is also testing its Borie High wildcat, the 1 Morton-King, near Cheyenne, Wyo., which found Muddy sand oil on drill-stem tests. Superior Oil Co. is now reported drilling below 20,083 ft. on the 1 Unit, world's deepest well in Sublette County, Wyoming.

WEST TEXAS.—Sinclair's 1 Sterling Williams, northwest Borden County wildcat, recovered 1,300 ft. of salt water when the pipe was broken down following a drill-stem test from 9,945-10,000 ft. On the same test, the well flowed 20 bbl. of oil and fluid, and unloaded oil when pipe was pulled. It was to drill ahead to 10,035 ft. and run another test. Humble's 1 Huddleston, second Sharon Ridge Canyon well, and west offset to the discovery, completed for a daily potential of 1,050 bbl. of oil, based on a 6-hour test.

CANADA.—Socony-Vacuum had encouraging recovery of natural gas in the lower Cretaceous at its 2 Craigmyle, LSD 9, 31-32-16w4, ¼ mile west of the company's 1 Craigmyle, a failure in which no favorable showings of gas were had above the Madison which underlies the Cretaceous. A second pay zone, Devonian D3 horizon, has been established at Canadian Gulf 1 Ellis, discovery 6 miles southwest of Stettler.

Martin

screw-lift GATE...

A low cost, low-pressure, center wedge, full-opening gate with non-rising screw. Used by oil companies for dewatering sedimentation basins and for other drainage purposes. Cast-iron body with iron or bronze seat in 6" to 24" sizes. Built for hard work, easy operation and minimum maintenance. Write for Type "W" Bulletin and prices.

Martin
IRON WORKS
P.O. Box 2857—Terminal Annex
Los Angeles 54, Calif.
Since 1900
Plant and General Offices, 1222 E. 28th Street

RECTORSEAL #1

Makes Tubing Connections leak-proof

10 years of service . . . ten years of field use guarantee you can be sure with Rectorseal #1. It's plain "leak-proof." Use Rectorseal #1 on all tubing connections. Apply it to threads before stabbing. Some operators report as much as 20% increase on pumping wells! By every test it's best for leak-proofing connections.
Ask your supply store for RECTORSEAL #1 by name.
Write: RECTORSEAL Dept. G
2215 Commerce St. Houston 2, Texas

RECTORSEAL
Manufactured by
RECTOR WELL EQUIPMENT CO., INC.
Fort Worth, Texas
MAKING THE OIL INDUSTRY SAFER

TEXAS GULF COAST

New Gas-Condensate Field Found in Lavaca County

HOUSTON.—A new gas-condensate field has been opened by Hassie Hunt Trust Estate 1 R. L. Smothers, in J. Chesler Survey, A-113, 8½ mi. southwest of Provident City field and 10 mi. northeast of Hope gas field, Lavaca County. The well has been gaged at 4,000,000 cu. ft. of gas per day through ⅜-in. choke, and production reportedly is from the 8,300-ft. level. Total depth is 9,330 ft. with casing set to 8,700 ft. Operators are testing for further gages. No details have been released as yet.

Gas sands are in evidence in R. A. Irwin and James R. Buck 1 Hine, wildcat in Arthur McCormick Survey, 20 miles southeast of Houston, Harris County. Three cores were cut between 8,528-47 ft., and although sand streaks were present, the cores were too much cut with gas and mud to have an analysis made. Plans for further drilling are not definite, but it is believed operators will continue to core.

A new oil pay in the Miocene sands has been opened by the Gulf Oil Corp. 6 E. H. Colby et al, in the Thomas Spraggins Survey, at Manvel, Brazoria County. The well flowed 126 bbl. of 25.3°-gravity oil per day through 5/32-in. choke, with 360 psi. tubing pressure. Total depth of the well is 5,392 ft. and production is through perforations at 4,040-60 ft.

A 13,000-ft. test in Jackson Pasture gas field, Chambers County, is planned by McCarthy Oil & Gas Corp. It is the 5 J. E. Jackson in the John S. Roberts League.

Claud B. Hamill is ready to run a string of production casing in the 1 Elvira Stephens, a confirmation wildcat in the Buck Snag area of Colorado County. The 7,000-ft. well is located in the I&GN Survey, Section 6, Abstract 314, approximately 1,600 ft. southwest of the 1 Schiurring, gas-condensate discovery well.

A structure of major proportions in shallow drilling at Speaks field, Lavaca County, has been proved by Grubb & Hawkins of Houston, who have brought in three gas producers. The Grubb & Hawkins 1 Sylvi Krandel, approximately 2¼ miles northeast of the 1 S. A. Clark discovery well, has been completed for a gas well from perforations at 1,998-2,008 ft., and the 1 E. P. Zock, Trustee et al, 1½ miles southwest of the discovery well, is producing gas from perforations at 1,780-92 ft.

TEXAS GULF COAST (DISTRICTS 2 & 3) SUCCESSFUL WILDCATS

Brazoria County: New oil discovery—Gulf Oil Corp. 6 E. H. Colby et al, Thomas Spraggins Sur., A-366, IP: 125 bbl. oil per day, 9/32-in. choke, top sand 4,040 ft., perf. 4,040-60 ft., GOR 275, gravity 25.3°, TP 360 psi.

Hardin County: New gas-condensate well, East Beach Creek—American Republics Corp. 1 C. M. Votaw, Sur. Sec. 200, A-801, IP: 178 bbl. oil per day through ⅛-in. choke, GOR 1,299, top sand 6,464 ft., TD 7,587 ft., perf. 6,464-68 ft., TP 2,285 psi., SIP 2,375 psi.

Jefferson County: New gas-condensate discovery, North Stowell—The Texas Co. 2 Koch-Spencer et al fee, F. Valmore League, dual completion, TD 6,850 ft., perf. 5,938-40 ft. and 5,444-50 ft., IP: 303 bbl. oil per day, 10/64-in. choke, CP 2,175 psi., SIP 2,179 psi.

TEXAS GULF COAST (DISTRICTS 2 & 3) WILDCAT FAILURES

DeWitt County: Humble Oil & Refining Co. 1 Mrs. Hilds Schmidt Dagg, 2½ mi. S. of Brushy Creek field, dry, TD 9,020 ft.

Harris County: Ryan Consolidated Corp. and Star Oil Co. 1 Mrs. Emma Zwink est., D. Harmon Sur., A-315, 3 mi. NW Westerfield townsite, dry, TD 7,226 ft.

Liberty County: Gulf Oil Corp. and Frazier 1 L. Friedman et al, E. Munson Sur., 4 mi. SE Dayton, dry, TD 9,010 ft.

Montgomery County: The Moran Corp. 1 Owne A. Smith, F. K. Henderson Sur., A-248, 2 mi. SW Willis townsite, dry, TD 5,775 ft.

Refugio County: Henshaw Bros., Rodney Delange and W. E. Fox, Tr. 1 John Schubert, 3 mi. SW Bonnie View field, dry, TD 7,020 ft.

TEXAS GULF COAST (DISTRICTS 1 & 4) WILDCAT FAILURES

Waller County: P. L. D. Well Service Co. 1 I. H. Stahlman, Sunnyside area, J. A. Padillo Sur., 2 mi. NW Sunnyside, Tex., dry, TD 6,299 ft.

Wharton County: Lloyd H. Smith 1 Erban Wendel, Thomas Tatum Sur., A-344, 3 mi. N Louise, dry, TD 5,905 ft.

SOUTH LOUISIANA

Whipstocked Well Cements Casing

NEW ORLEANS.—A string of 5-in. casing has been cemented to 9,080 ft. and testing is ready to commence on W. T. Burton 1 Glen Greathouse, semiwildcat northeast of South Lake Charles gas-condensate production in 9-11s-8w, Calcasieu Parish. The original hole was drilled to 9,867 ft., then sidetracked out and is now bottomed at 10,680 ft. in the new hole.

A new producer, The Texas Co. 2 Joseph O. Long, has been completed in Fordoche field, 29-6s-8e, Pointe Coupee Parish. Drilled to a total depth of 10,000 ft., completion was made through perforations at 8,197-8,207 ft., flowing 310 bbl. of 36.6°-gravity oil per day through 10/64-in. choke with tubing pressure of 1,250 psi.

Derrick is up on 1 Fairchild-Chauvin Unit, which is another Texaco operation west of Fordoche field in Section 28-6s-8e, and tools are being moved in for immediate operations.

SOUTH LOUISIANA SUCCESSFUL WILDCATS

Beauregard Parish: New oil discovery, Estherwood area—Barnsdall Oil Co. 1 M. Jones, 3-6s-9w, top sand 8,320 ft., TD 8,355 ft., IP: 324 bbl. oil per day, 10/64-in. choke, perf. 8,320-36 ft., GOR 1,651, 47.2° gravity, TP 1,850 psi., CP 1,600 psi.

Cameron Parish: Gas-condensate pool discovery—Stanolind Oil & Gas Co. 1 Louisiana State Lease 1133, Block 45, approximately 10 mi. offshore, Gulf of Mexico, top sand 8,738 ft., TD 8,814 ft., IP: 40 bbl. oil per day, ¼-in. choke, GOR 89,100, gravity 51.5°, TP 2,700 psi.

Jefferson Parish: New oil pay, Caminada Pass—Humble Oil & Refining Co. 1 Caminada Pass State Lease 804-D, Tract 1121, Block 23, top sand 6,128 ft., TD 6,380 ft., IP: 52 bbl. oil per day, 1/16-in. choke, perf. 6,128-38 ft., TP 40 psi., gravity 29.7°.

Terrebonne Parish: New gas pool, Bay Junop Dome—Union Oil Co. of California 2-9 State Lease 725-LL&E Unit, TD 4,593 ft., IP: 875,000 cu. ft. gas per day, 8/64-in. choke, shut in, TP 1,200 psi., perf. 3,493-98 ft.

SOUTH LOUISIANA WILDCAT FAILURES

Acadia Parish: Estherwood area—Sun-Sohio 1 American Land Co., 15-10s-1w, just S. of Estherwood townsite, dry, TD 12,270 ft.

Livingston Parish: Mallet Bluff area—Sohio Petroleum Co. 1 Livingston Lumber Co., 48-8s-3e, dry, TD 10,318 ft.

Plaquemines Parish: Breton Sound—Barnsdall Oil Co. 2 Breton Sound State Lease, W of North Point Light, Breton Island, Block 29 in Breton State Lease 1224, dry, TD 10,907 ft.

Quatre Bayou—Humble Oil & Refining Co. 1 Quatre Bayou, dry, TD 12,830 ft.

Vermilion Parish: Humble Oil & Refining Co. 2 Mrs. E. H. Mixon et al, 10-15s-1e, NE of East White Lake production, dry, TD 10,527 ft.

New WHELAND TABLE TOP ROTARY

WITH RAISED GUARD FOR SAFETY. Model A-20—20½" Through Table

HIGH SPEED, TRIPLE OIL BATH ROTARY

CHECK THE MANY SUPERIOR FEATURES OF THIS NEW WHELAND TABLE TOP ROTARY

- ✔ **SAFE:** Guard 1¾" above top of base safeguards against stepping on revolving table.
- ✔ **CONVENIENT:** Four straight sides make it easier to floor up around rotary.
- ✔ **LIGHT BUT STRONG:** A combination of cast and fabricated steel construction gives maximum strength with minimum weight.
- ✔ **EASY TO MOVE:** Four lifting eyes, lighter weight, sled type skids with provision for easy but secure fastening into place.
- ✔ **SUPERIOR LUBRICATION:** Proper grade lubricant for each part assured by three separate, securely sealed oil compartments. Fill and check from top. Three separate oil pipes with bell reducers make it easy to add oil, separate automobile type dip sticks for checking oil level.
- ✔ **QUIET:** Accurately cut, shock resistant, smooth running spiral gears eliminate noise and vibration.
- ✔ **PATENTED LOCKING DEVICE:** "T" handle, flush with top of table when not in use, gives positive lock on ring gear, eliminates all shock from pinion, pinion shaft and bearings.
- ✔ **UNIT PINION SHAFT MOUNTING:** Carried in one piece, cast steel sleeve. Shims for easy adjustment. Pinion shaft mounted on two double row Timken tapered roller bearings.

FULL MECHANICAL DETAILS ON REQUEST

FIELD SALES REPRESENTATIVES

L. E. FERGUSON
Field Sales Manager
Tulsa • Phone: 3-5406

F. Y. CRONK, JR.
Tulsa • Phone: 6-4697

CARL K. MOUNT
Bellaire, Tex.
Phone: Madison 2-9588

VANN M. CAMPBELL
Bellaire, Tex.
Phone: Madison 2-4742

GERALD W. HARMAN
Midland, Tex. • Phone: 3805

Service: W. E. SHORTS
Oklahoma City • Phone: 58-7129

WHELAND

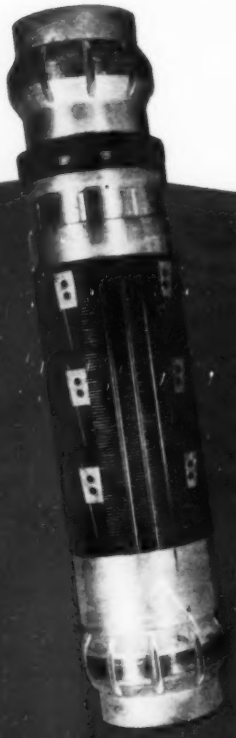
THE WHELAND COMPANY, CHATTANOOGA, TENN., U. S. A.
ROTARY DRILLING MACHINERY

DOMESTIC DISTRIBUTORS
Jones & Laughlin Supply Co.
Tulsa, Oklahoma
Stores and Offices in all Principal Oil Fields and Centers

EXPORT DISTRIBUTORS
Lucey Export Corporation
233 Broadway,
New York 7, N. Y.
Broad Street House
London E.C. 2, England

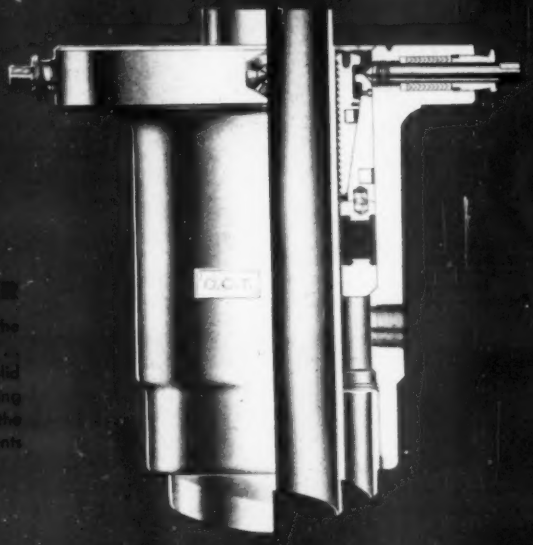
DRAW WORKS • SLUSH PUMPS • ROTARIES • SWIVELS • CROWN BLOCKS • TRAVELING BLOCKS

O-C-T "Precisioneered" Products

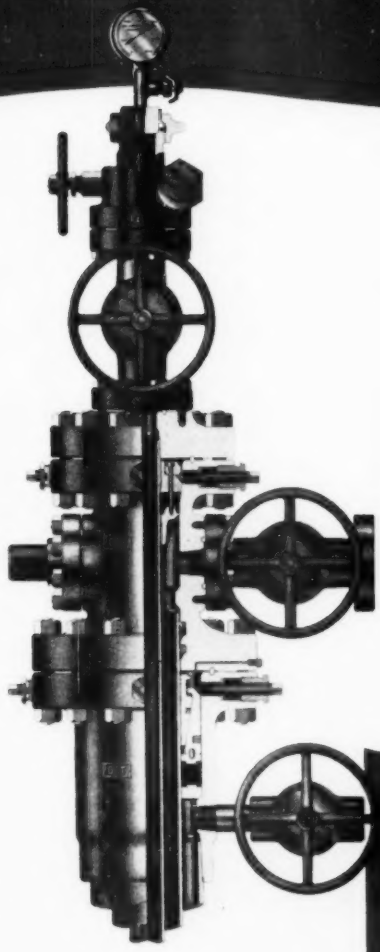


DH-1 "DOWN-THE-HOLE" HANGER

This revolutionary means of putting casing weight down the hole . . . the oil industry's first off-shore casing hanger . . . puts the weight on the outer string at a point where solid formation supports it. Thus, the new O-C-T "DH-1" Casing Hanger eliminates the column load and also eliminates the chances of dropping the inner strings in case of accidents to surface equipment.



help you drill for and produce oil with greater safety



As a result of progressive engineering and precision manufacturing practices, O-C-T now produces a line of "precisioneered" products that have materially increased the margin of safety in drilling, completing and producing high pressure gas and oil wells.

These O-C-T products, for example, were designed with specific oilfield needs in mind . . . manufactured with dependable performance in mind . . . sold with service in mind.

Specify O-C-T "precisioneered" products to help you drill for and produce oil with economy and greater safety.

WRITE TODAY ON YOUR LETTERHEAD FOR COMPLETE ENGINEERING DETAILS ON O-C-T "PRECISIONEERED" PRODUCTS.

O-C-T HIGH PRESSURE WELLHEAD ASSEMBLY

With the flexible O-C-T "C-19" Casing Head as the foundation, this O-C-T Wellhead and Tree Assembly has set a new standard for simplicity, for service, for safety on high pressure wells.

ASSOCIATION OF WELL HEAD EQUIPMENT MANUFACTURERS CERTIFIED

Oil Center Tool Co.

P. O. Box 6491, Houston, Texas

Export Representatives: Venezuela, Colombia, Peru and Ecuador: Berry & Hall, Apartado No. 204 Maracaibo, Venezuela; Bolivia: Arce-Ito Grand, Bolivia & Cia. Ltd., Sucursal, Middleburg, Argentina. Address Export Inquiries for All Other Countries to P. O. Box 6491, Houston 1, Texas.

OKLAHOMA

New Pennsylvanian Pool Found in Garvin County

INDICATIONS of another new pool in Garvin County have been given by Howell & Howell 1 J. S. Webster, SW SW NW 5-3n-2e, 1½ miles north of the East Pauls Valley field. Testing Pennsylvanian sand through casing perforations at 3,140-51 ft., the well swabbed at the rate of 2 bbl. per hour following an acid treatment of 1,500 gal. Hole was drilled to 3,552 ft. and casing run to 3,234 ft. Location is a little over a quarter mile west of a hole recently quit by Kingery-Patterson and Evans and Perkins. The latter had oil stains in the sand at 3,049 ft.

Shell Oil Co., Inc., is adding another good well in the Elk City field, Beckham County, in its 1-B Walters, C SE SE 15-10n-21w. With casing perforated at 9,370-80 ft., its flowed on initial production test 543 bbl. of oil in 19 hours with gas estimated at 657,000 cu. ft. per day. Flow was through ½-in. bottom hole with 24/64-in. top choke the first 7 hours and 40/64-in. choke 12 hours. Testing continues with additional perforations being made at 9,380-8,442 ft. The well, the fifth for the field, is ½ mile southwest of the discovery well. Hole was drilled to 10,496 ft. The 7-in. casing was run to 10,478 ft. and hole plugged back to 10,368 ft.

The same company's 1 McKenzie, C NE SW 9-10n-21w, 1½ miles northwest of the nearest producer, has casing perforated at 9,400-35 ft. for initial production tests, and, on the basis of previous drill-stem tests, assures a major extension of the field. It was drilled to 10,496 ft. and has casing to 10,476 ft. Locations already have been made for an offset location a quarter mile east and for another a half mile west, both on state land.

Production in the new Rich Valley field, Grant County, is being extended northward by Carter Oil Co. 2 Moore-Daniel, NE SE SE 36-26n-5w. In Wilcox sand, from which three previous wells are producing, the well, on a drill-stem test with packer at 5,838 ft., started flowing oil in 39 minutes after the tool was open and produced at the rate of 10 bbl. per hour. Gas, flowing at the rate of 350,000 cu. ft. per day, showed in 3 minutes. A total of 1,560 ft. of clean oil and 45 ft. of brackish water was recovered when tool was pulled. Vierson & Cochran and Mid-Continent Petroleum Corp. 1 Moore, NE SW SE 36-26n-5w, a northwest extension test, flowed 17 bbl. in 30 minutes of a drill-stem test at a total depth of 5,834 ft. However, the flow died and when the hole was swabbed it made salt water.

Teepee Drilling Co. 1 Warner, C SE NE 4-6n-1w, new pool opener near Lexington in southern Cleveland County, swabbed 64 bbl. of clean oil in 5 hours through casing, and after running tubing flowed at the rate of 4 to 5 bbl. per hour. Production is from open hole at 6,548-6,655 ft. with saturation in basal Pennsylvanian sand at 6,552-66 ft. Sand was shot with 10 qt. Two additional wells are being started by the same company, one a 40-acre east offset and the other a half mile southwest. With a number of other short-term leases in the area, additional development is due to get under way immediately.

ANNOUNCING

The Opening of Another Store at

1315 Barrow St.

HOUMA, LOUISIANA

where you will find a complete line of

✓INSIDE and OUTSIDE DRILL PIPE
✓TUBING and CASING CUTTERS
✓BOWEN OVERSHOTS

OFFERING BOTH SHORE AND OFF-SHORE SERVICES

CUTTING - FISHING - RENTAL TOOLS & SERVICE

24 Hour Service

TRI-STATE OIL TOOL CO.

TRI-STATE OIL TOOL CO. SHREVEPORT

SHREVEPORT, LOUISIANA Call 4-6623
MAGNOLIA, ARK. HOUMA, LA. Call 6834

OKLAHOMA SUCCESSFUL WILDCATS

Hughes County: Broyles 1 Scott, NE SE NE 4-7n-8e, pumped 6 bbl. of oil per day from Earlsboro at 2,438-73 ft., TD 3,234 ft.

Major County: Mazda 1 Boehs, NE SW SE 30-20n-10w, flowed 82 bbl. of 40°-gravity oil per day from Manning sand at 6,789-6,800 ft., ½-in. tubing choke, TD 6,898 ft.

Payne County: Quinlan 1 Loew, NE NW SW 21-19n-1w, flowed 20 bbl. of 43°-gravity oil per day from Skinner at 4,911-20 ft., TD 4,962 ft.

Fisher 1 Flohr, SE SW NW 5-18n-2e, pumped 50 bbl. of 37.9°-gravity oil per day from Skinner at 4,386-96 ft., TD 4,414 ft.

Stephens County: Phillips 1 Feagin, C NW SW 18-1n-4w, pumped 196 bbl. of 36.1°-gravity oil per day from sand at 8,038-8,106 ft., TD 8,712 ft.

OKLAHOMA WILDCAT FAILURES

Comanche County: Watts 1 Turner, SE SE NW 11-1n-11w, dry, TD 365 ft., granite wash 285 ft. with very slight show of oil.

Garvin County: Goldsmith 1 Smart, SE NW NW 32-1n-2w, dry, TD 1,025 ft.

Jefferson County: Finston 1 Noble, NE NW SW 12-4s-4w, dry, TD 3,025 ft. in Hoxbar.

Wilcox 1 Curry, SE SE NW 36-4s-9w, dry, TD 2,007 ft., granite wash 540-55 ft., sand 555-75 ft. and 1,620-55 ft., lime 1,995-2,007 ft.

Benson 1 Fillmore, NW NW SE 4-7s-6w, dry, TD 2,206 ft. in Pennsylvanian.

Logan County: Fleet 1 Coleman, SW SW SE 12-13n-1e, dry, TD 5,456 ft., Sylvan 5,097 ft., Viola 5,214 ft., first Wilcox 5,360 ft., second Wilcox 5,447 ft.

Jordan 1 Jordan, NW SW NW 15-15n-1e, dry, TD 5,520 ft., Viola 5,333 ft., second Wilcox 5,512 ft.

Love County: Turner 1 fee, NW NE SE 28-6s-2w, dry, TD 7,650 ft., Hoxbar 2,380 ft., Home Creek 3,023 ft., Adams Branch 3,504 ft., Palopinto 4,380 ft., Rocky Point 6,153 ft., Deese 6,848 ft., sand 6,867-95 ft. and 6,984-94 ft., Stockton sand 7,050-67 ft. and 7,074-86 ft.

Noble County: Arnold 1 Young, SE NW SW 7-23n-2e, dry, TD 4,622 ft., Mississippi lime 4,190 ft., Woodford 4,480 ft., Viola 4,509 ft., first Wilcox 4,556 ft., second Wilcox 4,604 ft.

Okfuskee County: Viersen 1 Fox, NW SE NW 26-11n-10e, dry, TD 3,377 ft., Gil-

crease sand 3,136 ft., Wapanucka 3,337 ft., Cromwell 3,355 ft.

Payne County: Morgan 1 Olinghouse, NE NW NW 7-19n-5e, dry, TD 3,950 ft., Checkerboard 2,430 ft., Wewoka lime 2,880 ft., Oswego 3,120 ft., Prue 3,260 ft., Verdigris 3,275 ft., Skinner 3,305 ft., lime 3,460 ft., Red Fork 3,480 ft., Inola 3,520 ft., Bartlesville 3,550 ft., Mississippi lime 3,819 ft., Woodford 3,910 ft., Misener 3,942 ft.

Pontotoc County: Burton 1 Sarkeys, NW NW NE 1-3n-6e, dry, TD 4,237 ft.

Pottawatomie County: Delaney 1 Hamm, SE NE SW 14-8n-4e, dry, TD 4,540 ft., Belle City 1,983 ft., base Calvin 3,594 ft., Earlsboro 3,833-70 ft., Mayes 4,030 ft., Woodford 4,055 ft., Hunton 4,220-58 ft., Sylvan 4,258-4,360 ft., Viola 4,360 ft., dolomite 4,471 ft., sandy dolomite 4,515 ft.

Roger County: Lawlis 2 Sappington, NW NW NW 10-6n-21w, dry, TD 715 ft.

Seminole County: Ligon 1 Keys, NW SW SE 16-11n-8e, dry, TD 3,688 ft., Checkerboard 1,110 ft., Hogshooter 1,628 ft., conglomerate 1,782 ft., Oswego 1,970 ft., Calvin 2,065 ft., coal 2,430 ft., Earlsboro 2,782 ft., lime 3,257 ft., Booch 3,378 ft., Gilcrease 3,512-73 ft., Union Valley 3,642 ft., Cromwell 3,653 ft.

SOUTHWEST TEXAS

Brooks County Gets Discovery

CORPUS CHRISTI.—A new oil discovery, L. M. Lockhart 1 Adolfo Garcia, approximately 1 mile northeast of Alta Mesa field and 1¼ miles north of East Alta Mesa field, Brooks County, has been completed flowing 106 bbl. of oil per day through 9/64-in. choke, with tubing pressure of 230 psi. and casing pressure of 375 psi. The well was dually-completed and total depth is 6,615 ft. with 5½-in. casing on bottom. It is producing through perforations at 3,840-50 ft. Lower perforations at 6,285-6,300 ft. produced gas-condensate, with no gage reported as yet.

H. R. Smith 1 E. S. Holst, outpost test near the southwest extension sector of Midway field, San Patricio County, promises to extend production approximately ½ mile southward. Drill-stem test made at 5,676-86 ft. recovered 800 ft. of pipe-line oil and 270 ft. of oil-cut mud in 15 minutes through ¼-in. chokes, with maximum working pressure of 87 psi.

Plymouth Oil Co. C-6 Hoffman, wildcat test in Duval County, 1 mile west of Terancahaus field, is perforating for completion attempt after drilling to total depth of 3,312 ft. Previous drill-stem test at 2,034-52 ft. recovered 200 ft. of pipe-line oil in 1 hour.

Sinclair-Prairie Oil Co. is ready to start production tests in its 1 John Jancik, wildcat 4 miles south-southwest of Alamo, Lot 10, Block 16, Porcion 72, Hidalgo County. Drilled to a total depth of 9,215 ft., 9⅝-in. pipe was set to 8,788 ft., and the well plugged back for perforation.

SOUTHWEST TEXAS (DISTRICTS 1 & 4) SUCCESSFUL WILDCAT

Kenedy County: New oil pool—Sarita, Humble Oil & Refining Co. B-6 John G. Kenedy, Jr., 3½ mi. NE Sarita, top sand 6,967 ft., TD 8,838 ft., perf. 6,967-73 ft., IP: 57 bbl. oil per day on gas lift, gravity 41°.

SOUTHWEST TEXAS (DISTRICTS 1 & 4) WILDCAT FAILURES

Caldwell County: R. V. Muckelroy & Sons 1 S. W. Vaughan, Boyd Lockhart Sur. 8 ¾ mi. E Lockhart, dry, TD 2,034 ft.

Duval County: M. L. Massingill and American Republics Corp. A-2 Brigidia Garcia et al, AB&M Sur. 412, A-1774, between Fitzsimmons and Chiltipin fields, dry, TD 4,860 ft.

Jim Hogg County: Cox & Hamon 1 Sweeney, Las Animas Grant, A-112, dry, TD 5,420 ft.

San Patricio County: Smith & Story, Inc., 1 F. L. Brown, Sr., M. P. J. and M. Delgado Sur., A-4, 3 mi. NE Mathis, dry, TD 4,920 ft.

Starr County: The Texas Co. 2 Samuel D. Bloomberg et al, Flores area, 13.6 mi. NE Grulla, dry, TD 8,860 ft.

Travis County: L. H. Luck 1 A. W. Lyckman, Henry Martin Sur. 65, 7 mi. NW Elgin, dry, TD 1,138 ft.

Val Verde County: O. W. Killam 1 Parker, Sur. 489, 7 mi. N of Del Rio, dry, TD 2,671 ft.

Webb County: O. W. Killam 1 Bruni est., Day and Cattle Co. Sur. 2195, 3½ mi. SW Bruni, dry, TD 3,281 ft.

Williamson County: J. M. Hardie 1 Kerlin, HT&B Sur. 5, dry, TD 1,630 ft.

J. W. Norman 1 H. Ging, R. College Sur., 1 mi. SE Coupland, dry, TD 1,360 ft.

Jesse Russell 1 Isabella H. Roberts, Thos. F. Gray Sur., 6 mi. W Liberty Hille, dry, TD 2,252 ft.

MISSISSIPPI

Humble Stakes Drill Site In Greene County

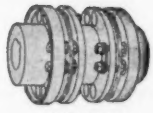
JACKSON.—Humble Oil & Refining Co. has obtained drilling permit for a test in Greene County. It will be located in 16-5n-8w, approximately 4 miles northwest of Sand Hill field, a recent discovery by the company.

Testing is continuing at Dorris Ballew 1 Natchez Country Club, 12-7n-3w, Adams County, which was drilled to 7,005 ft. and logged indications of oil at 4,382-95 ft. After sidewall cores were taken, 5½-in. casing was set and cemented at 4,436 ft. After 24 shots at 4,388-92 ft. a drill-stem test gave no results. However, on swabbing, mud, salt water, and a small amount of free oil was recovered.

THOMAS ALL METAL Flexible COUPLINGS

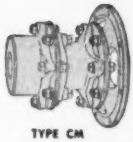
SPECIFIED WHEREVER 100% DEPENDABILITY IS DEMANDED

Refiners specify Thomas "Flexible" Couplings for PUMPS, COMPRESSORS, COAL PULVERIZERS, COOLING TOWERS and GENERATOR SETS.



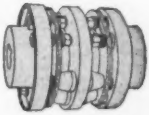
TYPE DBZ-C

Pipe Line Men know that Thomas "Flexible" Couplings on their Low or High Speed Pumps give 100% dependable service.



TYPE CM

Drilling Engineers get the most out of their equipment with Thomas "Flexible" Couplings on Engine, Gear and Mud Pump Drives.



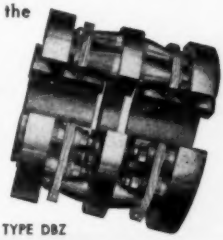
TYPE DBZ-B

In the Laboratory Thomas "Flexible" Dynamometer Couplings assure the greatest accuracy.

Thomas Flexible All-Metal Couplings Have No Wearing Parts. BACKLASH, FRICTION and CROSS-PULL ARE ELIMINATED.

NO LUBRICATION IS REQUIRED!

Write for the new Engineering Catalog

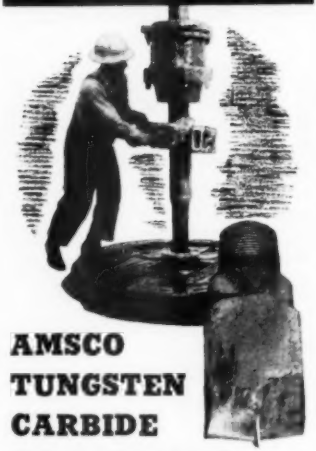


TYPE DBZ

THOMAS FLEXIBLE COUPLING CO.
WARREN, PENNSYLVANIA

FOR HARD FACING AND REPAIR

Amsco
WELDING
PRODUCTS



AMSCO
TUNGSTEN
CARBIDE
HARDFACING

saves you money!

Drillers agree that the *longer life* of fish tail bits built-up with Amsco Tungsite Inserts and hardfaced with Tube Tungsite or Tungrod saves a lot in time and money. The further down you get, the greater the cost of changing worn out bits . . . the greater the savings Amsco tungsten carbide hardfacing can give you.

Amsco tungsten carbide welding rods and electrodes are available in a wide range of screen mesh sizes. Amsco Tungsite Inserts are supplied in sixteen shapes and sizes for every type of bit. Get acquainted with Amsco Tube Tungsite and Tungrod.

Write for Bulletin W-C-75

American Brake Shoe Company

AMERICAN MANGANESE
STEEL DIVISION

of American Brake Shoe Company
Chicago Heights, Illinois
Offices in Principal Cities

C. Elliott Thompson and Sam D. Morrison will drill a test in SW SW 25-5n-3w, Hinds County. It is located on a 1,000-acre block and is approximately 2 miles east of Sun Oil Co.'s 1 H. T. Shuff, SE SE 27-5n-32, which was abandoned recently after reaching 2,634 ft. with only small oil shows.

In Sunniland field of Collier County, Florida, Humble Oil & Refining Co.'s 14 Gulf Coast Realty Co., 18-48s-30e, flowed at the rate of 192 bbl. daily on a drill-stem test taken at 11,540-76 ft.

MISSISSIPPI WILDCAT FAILURES

Copiah County: Amerada Petroleum Corp. 1 E. G. Nelson, 20-1n-4w, dry, TD 10,341 ft.

Hinds County: Sun Oil Co. 1 H. T. Shuff, 27-5n-32, dry, TD 2,634 ft.

Issaquena County: M. T. Halbouty-Jack Blalock 1 M. T. Reed, 23-10n-8w, dry, TD 3,712 ft.

Jones County: Danciger Oil & Refining Co. 1 Torry Smith, 32-10n-11w, dry, TD 7,510 ft.

Madison County: Broseco Corp. 1 I. Hesdorffer, 35-11n-4e, dry, TD 4,955 ft.

FLORIDA WILDCAT FAILURE

Columbia County: Sun Oil Co. 1 W. F. Johnson, 27-4s-16e, dry, TD 3,050 ft.

KANSAS

Arbuckle Pools Opened In Two Kansas Counties

ANOTHER Arbuckle lime pool apparently has been found by M. B. Armer in his 1 Andress, NE NE SW 2-21-13, a mile northeast of the Rothgarm pool, Stafford County. Arbuckle was topped at 3,512 ft. (—1,642 ft.), and with hole drilled in to 3,528 ft. and acidized with 1,000 gal., the well swabbed 8 bbl. of clean oil in the first 8 hours.

Rooks County also has another Arbuckle pool in Sam K. Pack and associates 1 Griebel, NE NE NW 8-7-19, 4 miles northwest of the Alcona pool, which made 50 bbl. of oil plus 50 bbl. of water in a 24-hour potential test. Arbuckle in this well was topped at 3,438 ft. (—1,454 ft.). Total depth is 3,456 ft. The pool has been named Locust Grove.

Petroleum, Inc., has extended the Max pool, Stafford County, a half mile west in its 1 Spangenberg, SE SW NW 10-22-12. In the Arbuckle at 3,643-46 ft. (—1,783-59 ft.), the entensioner swabbed at the rate of 15 bbl. of oil per hour after acidizing with 500 gal., and has been given a potential rating of 2,900 bbl.

The Bemis-Schutts field in Ellis County has been extended a half mile south and east by a 57-bbl. well at Westgate-Greenland Oil Co. 1 Windholtz, SW SW SW 3-12-17. Production is from the Lansing-Kansas City, in which casing was perforated at 3,360-70 ft., with hole plugged back from the Arbuckle, which failed to produce commercially.

KANSAS SUCCESSFUL WILDCAT

Rooks County: Pack 1 Griebel, NE NE NW 8-7s-19w, pumped 25 bbl. of 25 -gravity oil per day from Arbuckle, TD 3,456 ft.

KANSAS WILDCAT FAILURES

Butler County: El Dorado 1 Burnham, NW NW NE 7-28s-6e, dry, TD 3,158 ft., Kinderhook 3,030 ft., no Viola, Simpson 3,110 ft., Arbuckle 3,140 ft.

Inland 1 Manlove, NW NW NE 9-27s-3e, dry, TD 3,140 ft., Howard 1,250 ft., Topeka 1,373 ft., Lansing 1,980 ft., Kansas City 2,335 ft., Mississippi lime 2,784 ft., Simpson 3,102 ft., Simpson sand 3,134 ft.

Geary County: Hetzel 1 Sullivant, NE NE NE 36-13s-5e, dry, TD 3,042 ft.

Marion County: Uhl et al 1 Carpenter, NW NW NW 6-20s-4e, dry, TD 2,625 ft., Viola 2,552 ft.

Pratt County: Skelly 1 Bartlett, SE SE NE 20-27s-11w, dry, TD 4,589 ft., Arbuckle 4,539 ft.

Flynn 1 Hamilton, SW SW NW 26-28s-13w,

PENBERTHY
AUTOMATIC
INJECTORS

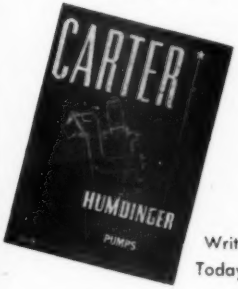
The accepted method for assuring an uninterrupted supply of feed water to oil field boilers, Penberthy Automatic Injectors will supply feed water to boilers at minimum cost, are quickly and easily installed, reliable under most severe operating conditions, require little attention and no careful handling. Highest quality design and rugged construction.

PENBERTHY INJECTOR CO.
DETROIT, MICH. Canadian Plant WINDSOR, ONTARIO

CARTER
CARTER
CARTER
CARTER
CARTER
CARTER
CARTER
CARTER
CARTER
CARTER
CARTER
CARTER
CARTER
CARTER
CARTER
CARTER
CARTER
CARTER
CARTER
CARTER
CARTER

FREE

Humdinger PUMP CATALOG



Write Today

Shows our complete Humdinger line—for every pumping job in the oil fields.

Mail today—It's yours FREE—
Ralph B. Carter Co.
196 Atlantic St., Hackensack, N.J.
Send me your free pump catalog.
Name
Company
Address

RALPH B. CARTER COMPANY
HACKENSACK, N. J.

dry, TD 4,636 ft., Simpson 4,596 ft., Simpson sand 4,514 ft., Arbuckle 4,606 ft.

Rooks County: Hartman 1 Burton, NW NW NW 14-7s-20w, dry, TD 3,570 ft., Arbuckle 3,530 ft.

Cities Service 1 Rolfs "B," SW SW NW 20-8s-18w, dry, TD 3,530 ft., Heebner 3,172 ft., Lansing-Kansas City 3,215 ft., cherty conglomerate 3,476 ft., Arbuckle 3,500 ft.

Amerada 1 Daehacor, SW SW NE 19-9s-20w, dry, TD 4,130 ft., reworked Simpson 3,984 ft., Arbuckle 4,039 ft.

Heathman & Honaker 1 Bartos, NW NW NE 8-10s-19w, dry, TD 3,833 ft., Simpson 3,748 ft., dolomite 3,766 ft.

Rush County: Huber et al 1 Derr, NE NE SW 14-17s-20w, dry, TD 4,115 ft., Arbuckle 4,062 ft.

Sumner County: Brack 1 Rose, NW NW SE 23-32s-3w, dry, TD 4,523 ft., Arbuckle 4,491 ft.

ROCKY MOUNTAIN

Big Play Develops In Denver Basin

DENVER — Developments during recent weeks in the Denver Basin indicate that there will be added interest in this area covering the northeastern part of Colorado, southeastern Wyoming, and southwestern Nebraska. Of particular interest will be tests of The Ohio Oil Co.'s 1 M. E. Egging, NE NE NE 11-15n-49w, in the Gurley area, 10 miles northeast of Sidney, Cheyenne County, Nebraska. The operator has cemented 9⅝-in. casing at around 4,400 ft., presumably on top of the Muddy sand. Ohio officials have made the wildcat a tight hole, but announced that casing was being run to test shows in their "first objective." It is rumored that the shows were excellent, and drill-stem tests confirmed the belief that the well was commercial at its present depth. In Wyoming, it was announced this week that Bridwell Oil Co. of Wichita Falls, Tex., has completed a farm-out deal with Seaboard Oil Co. for a 10,500-ft. test through Lakota sand at Meadow Prospect, and operations would start soon on the well. This 10,000-acre block is northeast of Horse Creek field where General Petroleum Corp. has production from the Muddy and Lakota sands. Both of these areas are north of the Borie High wildcat at 1 Morton-King, CE½ NW SW 13-13n-68w, Laramie County, Wyoming, where The California Co. is now testing shows found in the Muddy sand between 8,483-8,563 ft. On drill-stem test in this zone, the well made 2,200 ft. of 34°-gravity light oil prior to deepening the well to 11,374 ft. in granite. No shows were reported below the Muddy sand. Several wildcats for the Denver Basin are proposed in northeastern Colorado, and Carter Oil Co., Lion Oil Co., The California Co., Shell Oil Co., and others have blocks in this area.

Superior Oil Co. is now reported drilling below 20,083 ft. at the world's deepest well at 1 Unit, SW NE SW 27-27n-103w, Pacific Creek, Sublette County, Wyoming. Operator cemented 7-in. casing at 19,765 ft. and the well is carried as a tight hole with no formation tops or tests released.

Completion by Continental Oil Co. of its important discovery 3 miles southeast of Sussex field, Johnson County, Wyoming, is expected to increase wildcat activity along the west side of the Powder River Basin in Wyoming. The well is the 5 Unit, SE SW NW 23-42n-78w, and a discovery is indicated by previous completion of a Lakota sand failure between the well and the field proper. Faulting is evident between the test and the field, and the present well ran some 275 ft. higher structurally than the discovery well which was completed last year. The well flowed 11 bbl. of oil per hour through 18/64-in. choke with tubing pressure of 275 psi. flowing, and it is expected that production will increase as the well cleans. Since completion of the Sussex discovery, Continental has drilled one Lakota sand failure, one location east, and one producer, one location west, and is now drilling an extension north.

On the west and south sides of the Green River Basin in southwestern Wyoming two wells are now reaching interesting depths. On the Moxa Unit, Union Oil Co., The Texas Co., General Petroleum Corp. and Union Pacific Railroad Co. are below 10,700 ft. at 1 Government, C NE NE 30-19n-112w. The well is located on a seismic high, with the block immediately adjoining the Church Buttes unit, where Mountain Fuel Supply Co. is now completing its sixth well in the Dakota sandstone at around 13,000 ft. Objective of the Moxa wildcat is also the Dakota at around 12,500 ft. On the south side of the basin, Stanolind Oil & Gas Co. is new drilling below 7,000 ft. at 1 Unit, C NE NW 3-12n-101w, Canyon Creek, Sweetwater County. Several shows of gas have been logged in Tertiary sands, but the well is projected to around 12,000 ft. for a test of Dakota sand. The Canyon Creek structure produces gas from shallow Tertiary sands but has not been drilled to lower formations.

WYOMING SUCCESSFUL WILDCAT

Johnson County, Sussex: Continental Oil Co. 5 unit, SE SW NW 23-42n-78w, oil well, TD 7,485 ft., Fox Hills 2,323 ft., Lewis 2,362 ft., Mesa Verde 3,080 ft., Steele 3,493 ft., Shannon 4,647 ft., Niobrara 5,896 ft., first Wall Creek 6,482 ft., second Wall Creek 6,815 ft., Dakota 7,390 ft., Lakota 7,458 ft.

WYOMING WILDCAT FAILURE

Crook County, Moorcroft: Amerada Petro-

leum Corp. 1 Cortes, C SW SW 18-49n-67w, TD 5,832 ft., dry, Pierre 1,357 ft., Niobrara 3,731 ft., Thermopolis 5,438 ft., Dakota 5,728 ft., Lakota 5,810 ft.

COLORADO WILDCAT FAILURE

Eagle County, Brush Creek: Whamplin Refining 1 Black, NE SW NE 4-5s-84w, TD 6,321 ft., dry, Beldon 4,810(?) ft., Metamorphic rock 6,090 ft.

MONTANA WILDCAT FAILURE

Big Horn County, Ash Creek: Shell Oil Co., Inc., 1 Crow Tribal 7904, NE NE NE 36-9s-37e, TD 11,519 ft., dry, Eagle 4,110 ft., Muddy 7,612 ft., Cloverly 7,953 ft., Sundance 8,170 ft., Chugwater 8,645 ft., Tensleep 9,401 ft., Charles 9,768 ft., Big Horn 10,864 ft., Lander sand 11,182 ft., Cambrian 11,191 ft.

N. CENTRAL TEXAS

Three Clay County Fields Get Apparent New Pays

WICHITA FALLS. — Three Clay County fields had prospects of new pay discoveries this week. In the southern section of Acme field, S. D. Johnson 2 Selvidge, T. Morehead Survey, drilled shows of oil in the lower Caddo limestone from 5,619-39 ft., then ran a 90-minute drill-stem test of the interval. Gas showed in 16 minutes and recovery was 280 ft. of oil and 180 ft. of heavily oil-cut mud. Bottom-hole pressure was 2,325 psi. in 15 minutes. An additional 360 ft. of oil was recovered on a second test from 5,619-53 ft. Drilling continued below 5,656 ft.

Fain & McGaha 5 Myers & Schulz, Block 6, J. H. Belcher Survey, 3 miles southeast of Deer Creek, indicated a third and deeper pay for Amos and Andy (Strawn sand) field when it drilled good oil shows in the Vogtsberger sand section of the Strawn, from 4,521-35 ft. A 1-hour drill-stem test from 4,517-45 ft. recovered 140 ft. of oil and gas-cut mud. Operators said leaky drill pipe prevented successful completion of the test. Casing was set at 4,502 ft. and completion attempt was to be made in open hole to 4,552 ft.

In Lazy B field of southwestern Clay County, Gulf Oil Corp. 1 Glayds Ewing, Block 19, HT&B Survey, southwest offset to the field's Caddo discovery, shot the Strawn sand with 110 qt. from 4,550-85 ft., and was cleaning out. Previous to the shot, swabbing recovered approximately 18 gal. of oil an hour.

Archer County. — Gulf 1 G. F. Boone, Block 3, S. P. Survey, 10 miles north of Megargel, topped the Caddo at 4,964 ft., and drilled oil shows to 5,040 ft. A 2-hour drill-stem test from 4,967-5,040 ft. recovered 15 ft. of slightly oil-cut mud. Drilling continued below 5,319 ft.

Three miles southwest of Vogtsberger field, Bay Oil Corp. 1 W. M. McGregor, Block 7, H. H. Duff Survey, was drilling in lime at 5,373 ft. Five miles southeast of Archer City, S. D. Johnson 1 F. J. Henry, Lot 35, Block 5, Clark & Plumb subdivision, was drilling below 3,800 ft.

Wise County. — One-half mile west of Chico field, James F. Breuill 1 Morris, J. W. McClain Survey, recovered 30 ft. of slightly oil and gas-cut mud on a 2-hour drill-stem test of the conglomerate at 5,409-30 ft. A second test from 5,564-69 ft. failed and operators prepared to retest the same section.

One-half mile southeast of the Daly Ellenburger discovery, Signal Oil & Gas Co. et al 1 Horton, Unit 1, G. A. Frazier Survey, was looking for the Ellenburger in coring at 6,555 ft. Diamond bit coring started in the Barnett shale at 6,540 ft. and will continue to 6,590 ft.

Northwest of the same discovery, Signal and Loffland Brothers 1 Daly, Unit 2, J. F. Williamson Survey, topped the Caddo at 3,791 ft. and had first saturation at 3,874 ft. Operators drilled to 3,882 ft., then set casing to 3,840 ft. and reported a flow of about 20 bbl. of oil an hour while running casing. When plug was drilled and tubing run, it would not flow. It was shut in for orders, with 310 psi. pressure on the casing.

NORTH CENTRAL TEXAS (DISTRICTS 9 & 7-B) SUCCESSFUL WILDCATS

Haskell County: Humble Oil & Refining Co. 1 C. G. Burson, Blk. 12, J. Korus Sur., 8 mi. SW Weinert, flowed 150.6 bbl. 38.8°-gravity oil a day, 5/16-in. choke, Pennsylvanian, 4,735-55 ft., TD 6,031 ft., PB 4,760 ft., GOR 450 cu. ft., TP 80 psi.

Nolan County: G. H. Brodie and Hunt Oil Co. 1 J. P. Aycock, SW NE 58-21-T&P, 4 mi. SE Sweetwater, pumped 15 bbl. 45°-gravity oil a day, Ellenburger, 6,150-66 ft., TD.

Throckmorton County: James H. Snowden 1 Norton heirs, Sec. 2315, TE&L Sur., 7 mi. NE Woodson, flowed 132.4 bbl. 41°-gravity oil in 4 hr., ½-in. choke, Mississippi lime, 4,621-30 ft., TD, GOR 600 cu. ft., TP 875 psi., CP 700 psi.

NORTH CENTRAL TEXAS (DISTRICTS 9 & 7-B) WILDCAT FAILURES

Archer County: Bridwell Oil Co. 3-B Bridwell-Jackson, W. Baldridge Sur., 10 mi. N Archer City, dry, TD 5,200 ft., Caddo 5,074 ft.

Fowler Farm Oil Corp. 1 E. Colgan, Sec. 2, SP Sur., 7 mi. N Megargel, dry, TD 1,585 ft.

Howell & Howell 1 Weaver, Sec. 2406, TE&L Sur., 3½ mi. SE Megargel, dry, TD 4,622 ft., Caddo 4,390 ft.

Brown County: J. H. Holt 1 H. Fomley, Patrick Curlong Sur. 151, 3½ mi. E Crosscut, dry, TD 2,404 ft.

Callahan County: Castle Oil Co. and C. C. Winfrey 1 T. E. Hayden, Blk. 116, Uni-

Star's "Rubber-Mount" design places 30 rubber mountings under the crown sheave (illustration below) and in the spudder. The spudder floats completely on rubber at all bearing points and sheaves.

The NEW No. 72 "Rubber-Mount" SPEED STAR . .

✔ NEW, PROVEN DESIGN
✔ NEW DRILLING ACTION
✔ NEW EARNING TOPS

. . . ONE OF A SERIES OF MODERN, • PROFIT-MAKING • DRILL RIGS BUILT BY A COMPANY 60 YEARS IN BUSINESS

ANOTHER "FIRST"—

Star's patented "Rubber-Mount" design, which gives full protection to the machine and develops a powerful drilling motion with terrific penetrating ability. The No. 72 Speed Star easily swings tools averaging 2500 lbs. on wells 6" to 16" diameter. It is ideal for the drilling and cleaning out of shallow wells.

Ask for Bulletin No. 72-B.

OTHER No. 72 FEATURES:

1. Star's famous balanced construction distributes load, eliminates side strain and prolongs life.
2. Double catheads are regular equipment, with friction clutch control for safety.
3. Extra large capacity masts with power hoists.
4. Three full-width reels, chain-driven, with friction clutch controls, provide flexibility for all operations.
5. 23 anti-friction bearings conserve power and lengthen service.

Mountings: truck, full trailer, semi-trailer.

"If It's a Speed Star, It's a Fast, Proven Money-Maker"

THE STAR DRILLING MACHINE COMPANY

475 WASHINGTON STREET • AKRON 11, OHIO

Drilling Machines and Tools Since 1889

versity Sur., 10 mi. N Putnam, dry, TD 392 ft.

Castle Oil Co. 1 Fred Wylie, Sec. 56, L.A.L. Lands, 9 mi. N Putnam, dry, TD 408 ft.

Cooke County: Ralph and Eugene Harvey 1 I. B. Smith, D. B. Cook Sur., A-241, 6 mi. S Gainesville, dry, TD 2,838 ft.

W. O. Russell and C. B. Slemp 1 Mary Griggs, E. Farris Sur., 3 mi. SW Hood, dry, TD 1,252 ft.

Jack County: Cox Drilling Co. 1 W. J. Eath..rly, J. McNeal Sur., 4 mi. W Jacksboro, dry, TD 5,721 ft., swabbed some oil at 5,001-09 ft.

J. J. Lynn 1 Estelle Willcocksin, M. Aiken Sur., 4 mi. NE Jacksboro, dry, TD 6,250 ft.

Taylor County: Drilling & Exploration Co., Inc., 1 L. E. Riney, NW NW SE 5-9-SPRR, 5½ mi. SE Blair, dry, TD 3,700 ft., reef lime 3,085 ft.

Wichita County: Bilbrey & Albritton 1 T. L. Burnett-Tide Water, Sec. 1, H&GN Sur., 5 mi. W Iowa Park, dry, TD 942 ft.

LA.-ARK.

Columbia County Test Has Dry Gas Show

SHREVEPORT.—McAlester Fuel Co. 1-A T. O. Giles, 1½ miles northeast of Atlanta field in NW NE 6-18s-18w, Columbia County, Arkansas, made a good show of dry gas from the Smackover lime but the drill stem broke down in 2½ minutes and operations were shut down for repairs at 7,746 ft. The test was run from 7,739-46 ft., using ⅝-in. bottom and ⅜-in. top chokes and 500 ft. of water cushion. Gas came to the surface immediately, followed by gas-cut water cushion in 2 minutes. Maximum flowing pressure was 800 psi.

Cores from 7,736-41 ft. recovered dolomite with gas odor, dolomite and shale, then 4 in. of slightly porous oolitic lime with oil odor. A core from 7,741-46 ft. recovered 4 ft. of porous lime with gas odor. With elevation of 210 ft., top of the Smackover was 7,726 ft.

South of Lisbon field, Carter Oil Co. 1 Russell, 33-17s-16w, Union County, had total depth at 7,880 ft. in the Smackover and was taking side-wall cores. It cored light gas odor in lime at 7,342-52 ft.

In Bossier Parish, Louisiana, Barnsdall Oil Co. 1 Ardis & Co., distillate discovery south of Sarepta field, in 27-22n-11w, prepared to complete from two zones of the Cotton Valley formation. Flowing through ¼-in. choke, recovery was an estimated 275 bbl. of distillate in 24 hours from perforations at 9,156-86 ft. A 15-hour drill-stem test from 8,712-34 ft. recovered 117 bbl. of distillate. Tubing pressure was 1,475 psi. on the first test, and 2,200 psi. on the second test.

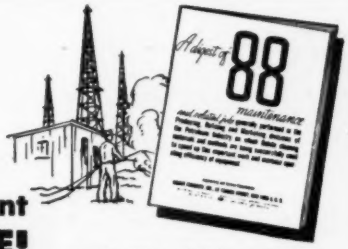
Claiborne Parish.—Hunt Oil Co. 1 J. H. Owens, 19-23n-6w, was drilling below 9,880 ft., possibly in the Smackover. C. R. Schuster 1 Dance, 20-19n-6w, had total depth at 7,400 ft., in the Travis Peak. It was reported to be running electrical surveys.

Natchitoches Parish.—Continental Oil Co. 1 Bostrop State Bank, SE NE 18-10n-6w, new wildcat 2 miles north of Clarence, was drilling in the upper Cretaceous at 4,380 ft.

Union Parish.—Carter Oil Co. 1 Hicks, 22-21n-3w, was drilling below 7,154 ft. Southwest Gas Producing Co. 1 Weldon, 24-21n-3w, was drilling at 7,122 ft.

NORTH LOUISIANA SUCCESSFUL WILDCAT

Caddo Parish: Phillips Petroleum Co. 1 C. Ellerbe, 17-15n-12w, flowed 38 bbl. 61°-gravity distillate a day, with 2,195,000 cu. ft. of gas, ¼-in. choke, perforated Kilpatrick lime of Rodessa section at 4,450-70 ft., tubing pressure 1,995 psi., casing pressure 2,050 psi., TD 9,014 ft. in Cotton Valley, PB 4,474 ft.



your guide to steam-detergent cleaning—FREE!

If you are in the producing, refining, natural gas or pipe line divisions, the guide above, is for you. It contains facts designed to help you save on your cleaning jobs.

Guide gives full details about built-for-the-job Oakite Solution-Discharging Steam Gun and the low-cost, easy way to install it. Tells how to make up steam-cleaning solution with effective Oakite cleaning compounds. Also gives full details for stripping paint with the Oakite Gun. Shows how you can simplify such jobs as cleaning pump and drilling equipment; rotary tables, mud hogs, crown blocks, swivels and the like. It's not only versatile, but being 3-ways effective (steam, pressure, detergency) it lops hours off your maintenance-cleaning schedule. Why not arrange with your neighborhood Oakite Technical Service Representative for a demonstration. Or . . .

JUST SAY THE WORD AND we'll send you this "Oakite 88 Digest." Our address: Oakite Products, Inc., 44C Thames St., New York 6, N.Y.

Technical Service Representatives in Principal Cities of U. S. & Canada

OAKITE
REG. U. S. PAT. OFF.
SPECIALIZED INDUSTRIAL CLEANING
MATERIALS • METHODS • SERVICE

OAKITE PRODUCTS, INC.,
44C Thames St.,
NEW YORK 6, N. Y.

VIKING

FULFILLS THE NEED FOR A TOTALLY ENCLOSED 200 G. P. M. SINGLE ROTARY PUMP UNIT!

Send For Full Details TODAY! Ask For Sheet SP-223.T

For fast loading and unloading of gasoline, fuel oil or Diesel fuel, the Viking model Q162 is the answer. Ideal for installing out of doors without a pump house. Reduce your unloading time with this big rugged unit. Built to take it.

OUTSTANDING FEATURES:

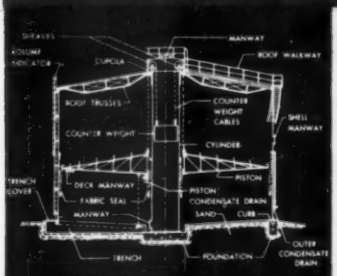
1. A 200 gpm at 375 rpm size Viking pump.
2. New oil-tight, cast iron gear case. No leakage.
3. Radial bearing for pump shaft.
4. Stainless steel pump shaft. No rusting.
5. Viking valve on pump head. (Optional)
6. Extra long stuffing box on pump.
7. New rugged, base and motor rails. Built to accept up to 15 H.P. motor.
8. Five ball check grease cups. (Other style grease fittings optional)
9. Complete unit totally enclosed for outside use without protection of any kind.

VIKING
AN HONORED NAME IN PUMPING

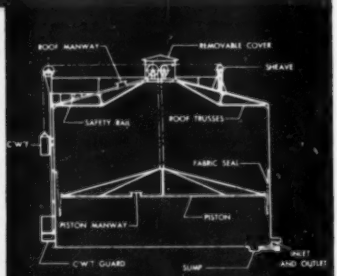
See Our Catalog in SWEETS

Viking PUMP COMPANY
Cedar Falls, Iowa

WIGGINS Dry Seal GASHOLDERS



OVER 60,000 CU. FT.



FROM 7,500 to 60,000 CU. FT.

have proved a profitable investment, because they offer . . .

1. A Gasholder with efficient operation and easy maintenance.

a. Not affected by snow load since all moving parts are under cover.
b. All major moving parts accessible for inspection during operation.
c. A vapor balancer that can be made gas free for repairs in a few hours.
d. A vapor seal that has a life equal to that of the tank.
e. A Gasholder working pressure of ⅛ to ¼ inch of water.

2. A vapor balancer that has a 100% Dry Seal.

a. Eliminates corrosion problems attendant with wet seals.
b. Requires no heating system during freezing weather.
c. Has no evaporation loss through a water or oil seal.
d. Requires no attention, adjustment or lubrication.

3. One vapor balancing mechanism for all tanks.

a. Provides flexibility of operation.
b. Permits repair of any tank in group without affecting operation.
c. Allows vapor balancer to be removed without disturbing storage tank operation.
d. Accomplishes all venting through one master valve.
e. One structure for protection of all standing and pumping loss.

For more complete details and Pay-Out Analysis, write for Bulletin VB-10

GENERAL AMERICAN TRANSPORTATION CORPORATION

WIGGINS VAPOR SEALS
GENERAL AMERICAN

135 SOUTH LA SALLE STREET, CHICAGO 90, ILLINOIS

BRANCH OFFICES: New York · Washington, D. C. · Cleveland · Buffalo · Pittsburgh · New Orleans · Tulsa · Dallas · Houston · Seattle · Los Angeles · St. Louis · San Francisco

Sub-licensees

WESTERN STATES: Consolidated Western Steel Corporation, San Francisco — Los Angeles
SOUTHERN STATES: Wyatt Metal and Boiler Works, Houston — Dallas, Texas
GREAT BRITAIN: Motherwell Bridge & Engineering Co., Ltd., Scotland
FRANCE: Etablissements Delattre & Frouard réunis, Paris
CANADA: Toronto Iron Works Ltd., Toronto

NORTH LOUISIANA WILDCAT FAILURES

Sabine Parish: Union Oil Co. of California 1 Long Bell Lumber, NE NW 35-7n-13w, dry, TD 6,001 ft., base Austin chalk 3,716 ft., lower Cretaceous 3,815 ft., upper Paluxy 4,060 ft., lower Paluxy 4,348 ft., Mooringsport 5,075 ft., Rodessa porosity 5,998 ft., elev. 229 ft.

Webster Parish: Clem S. Clarke 1 T. Jordan, NE SE 16-17n-8w, dry, TD 603 ft.

Winn Parish: The Texas Co. 1 Urania Lumber Co., NW SW NW 17-11n-1e, dry, TD 3,800 ft.

CANADIAN FIELDS

Socony-Vacuum Tests Gas Near Previous Failure

CALGARY—Socony-Vacuum Exploration Co. had a large natural gas flow at its 2 Craigmyle during drill-stem test in the lower Cretaceous around 4,024 ft. Gas hit the surface 1 minute after tester was opened, and a large but unmeasured flow was allowed for about 40 minutes before tester was closed. Pipe was being pulled at last report, to determine any fluid content that may have entered the pipe.

The well is located in LSD 9, 31-32-16w4, ¼ mile due west of the company's 1 Craigmyle, test that flowed oil to the surface in 19 minutes during drill-stem test of the Madison limestone last fall, but failed to yield when efforts were made to place the well on production. It is believed, however, that the first venture could have been made into a producing oil well if the producing zone had been left open rather than running pipe and drilling about 2,000 additional feet. Gun perforations and acidization failed to bring results when the well was plugged back to the Madison and swabbing was attempted.

Results at the second well are encouraging, inasmuch as the Craigmyle did not have the favorable showings of gas in the lower Cretaceous above the Madison. It is expected that the Madison limestone will likely be entered at 2 Craigmyle within the next few days.

Stettler.—Around 50 ft. of D3 zone Devonian pay has been established at Canadian Gulf 1 Ellis, dual zone oil discovery near the town of Stettler. Drill-stem tests in the lower D3 horizon indicate that initial potential will be around 1,300-1,500 bbl. daily, with gas-oil ratio between 500-550 cu. ft. per barrel. Gravity of D3 oil was checked at 28°. D2 gravity ranged from 30° to 32°.

The Stettler well, about 100 miles northeast of Calgary completed at depth of 5,385 ft. Liner has been set at bottom, and crew are currently cleaning out hole to bottom prior to gun perforating and running production tests. Further follow-up drilling is expected to be announced within the next 2 weeks.

Jarrow.—First drill-stem test in the upper part of the lower Cretaceous will be run in the next few days at the 1 Jarrow, wildcat in the central Alberta Plains. Located a few miles south of the great Viking-Kinsella gas field, in LSD 1, 20-45-10w4, the test marked up initial success when the Viking sand was found at about 2,152 ft., and a drill-stem test of interval 2,148-57 ft., yielded a natural gas flow rate exceeding 5,000,000 cu. ft. daily, with bottom-hole pressure of 750 psi. Now at 2,521 ft. in the lower Cretaceous, Jarrow is coring and will likely be testing in a day or two. A protective string of 7-in. casing will probably be run prior to deepening in search of lower Devonian objectives.

Leduc-Woodbend.—Continental-Bailey 16 Woodbend, in LSD 4, 18-51-25w4, ¼ mile west of Imperial 1 Gilbert abandonment, has success indicated in drill-stem test of lower Cretaceous interval 4,204-24 ft. The well blew oil during test, with estimated flow rate of 50 bbl. hourly, with flow

pressure around 1,200 psi. Production string of casing has been run to bottom 4,224 ft., and preparations are being made to drill out and gun perforate for production.

Wildcat abandonments.—Hudson's Bay 1 Acadia, LSD 9, 9-21-7w4, TD 3,412 ft. Bear 1 Vampire, LSD 7, 28-87-12w4, TD 2,240 ft. Stanolind 1 Plamondon, LSD 16, 9-68-16w4, TD 2,510 ft. Brook 1 Stanmore, LSD 7, 22-30-11w4, TD 5,210 ft.

EASTERN CANADA

Manitoba.—Brandon Exploration Co., a subsidiary of Standard of California, is starting seismographic surveys in southwestern Manitoba, in the area south and west of Brandon. A 3,000-ft. test will be drilled at Lyleton, 3 miles north of the international boundary.

CALIFORNIA

Operators Continue To Shut In Wells

LOS ANGELES.—The shutting in of wells producing heavy crude continues in the state with Shell Oil Co., Inc., making the latest such announcement, curtailing 1,900 bbl. daily output at Coalinga field. Further closures by Shell are understood to be under consideration. In the same field, Standard Oil Co. has turned two poor producers into water wells: its 42-28F P.F.C. and 46-21F Pleasant Valley Farms.

Despite the problems of the heavy crude market, notices of intent to drill still run ahead of last year. Wildcats account for about a third of the cumulative figure which now totals 1,129 compared with 1,087 for the same period last year.

Six producing wells were completed in Placerita Canyon area of Los Angeles County. Five were in Section 31-4n-15w: Gordon Oil Co. brought in its 2 Peggy Moore and 2 Wickman-Ferrier; King Oil Co. completed its 5 Peggy Moore; Rothschild Oil Co. finished its 1 Rassp. Ramon Somavia's 1 Ashley was the best producer, flowing better than 1,000 bbl. of approximately 21°-gravity oil, with total depth at 1,976 ft. Other wells in the block have produced 50-400 bbl., all from the Pico which runs from about 1,300-1,900 ft. George Terry Drilling Co.'s 2 Breckinridge, 36-4n-16w, pumped 25 bbl. of 12.8°-gravity oil per day, cut 10 per cent, bottomed at 1,596 ft. There are 27 other wells in various stages of completion in this area.

Wilshire Oil Co. has abandoned its 22 Cantua in Cantua Creek area, 10-17s-15e, Fresno County. Shows were found in the Temblor at 6,543-62 ft., but tests failed to indicate commercial production.

Chino Hills in San Bernardino County appears to be attracting considerable attention. Grayco Oil Co. bottomed the 2 Grayco at 4,100 ft. in 13-3s-8w. First production was water. After swabbing, the well was put on pump and field estimates now place production between 200-400 bbl. A previous test was made by the company at the 1 Grayco which flowed hot salty water and the formation was cemented off. Now, Grayco may go back into the first well in an attempt to reach the oil zone. The new well is 900 ft. north of the old Mahala wildcat that was completed dry at 4,010 ft. Tide Water Associated Oil Co. holds an adjoining lease and plans development work soon.

CALIFORNIA SUCCESSFUL WILDCATS

Kern County, Devils Den area: New pay, Honolulu Oil Co. 67 Alferetz, 14-25s-18e, 208 bbl. of 18°-gravity oil per day, cut 5.4 per cent, Kreyenhagen 2,460 ft., elev. 610 ft., TD 2,505 ft.

Ventura County, West Mountain area: Kirk Oil Co. 1 Richardson Comm., 14-3n-21w, flowed 100 bbl. of 25°-gravity oil in 12 hours, cut 0.1 per cent, elev. 607 ft., TD 5,013 ft.

CALIFORNIA WILDCAT FAILURES

Kern County, Comanche Point area: Lub-

. . . designed specially for the storage of corrosive oil products. The entire under surface being in complete contact with the tank contents, no vapors are trapped or can collect beneath the roof.

The basic exclusive conservation features of the Hidek Roof including the triple seal and extra large pontoons are retained.

Write for bulletin FR-3 which gives further details on Wiggins Lodek Floating Roofs.

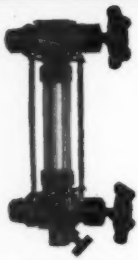
WIGGINS CONSERVATION STRUCTURES

Hidek Floating Roof
Dry Seal Lifter Roof
Improved Breather Roof
Lodek Floating Roof
Dry Seal Gasholder
Improved Balloon Roof

GENERAL AMERICAN TRANSPORTATION CORPORATION
135 SOUTH LA SALLE STREET, CHICAGO 90, ILLINOIS
BRANCH OFFICES: New York • Washington, D. C. • Cleveland
Buffalo • Pittsburgh • New Orleans • Tulsa • Dallas
Houston • Seattle • Los Angeles • St. Louis • San Francisco
WIGGINS VAPOR SEALS GENERAL AMERICAN TRADE MARK

Sub-licensees
WESTERN STATES: Consolidated Western Steel Corporation San Francisco — Los Angeles
SOUTHERN STATES: Wyatt Metal and Boiler Works, Houston — Dallas, Texas
GREAT BRITAIN: Motherwell Bridge & Engineering Co., Ltd., Scotland
FRANCE: Etablissements Delattre & Frouard reunis, Paris
CANADA: Toronto Iron Works Ltd., Toronto

PENBERTHY
"ALL IRON"
LIQUID LEVEL GAGES



Body made from a special high strength alloy iron, shanks alloy steel and trim stainless steel. Extra heavy construction throughout, automatic and positive shut-off if glass breaks, heavy duty stuffing boxes. Conform with A.P.I.—A.S.M.E. requirements.

The "All Iron" is one of the complete line of Penberthy gages that meet every liquid level gage requirement.

PENBERTHY INJECTOR CO.
DETROIT, MICH. Canadian Plant WINDSOR, ONTARIO

Standco
NO-SMOKE
STANDCO BRAKE LINING
Stands the gaff and gets the job done without scoring brake rims. See pages 3608-3613, Composite Catalog.
Standco Brake Lining Co.
HOUSTON

Oil Forms
Immediate delivery from stock of KRAFTBILT forms designed for every need in oil production record keeping. Fast service. Write for FREE catalogs.
Ross-Martin Co.
415 E. 4th Street
Tulsa 1, Okla.

king, Henry & Assoc. 1 Tejon, 36-32s-29e, (formerly 2 Tejon), dry, TD 1,082 ft., Santa Margarita 910 ft., elev. 780 ft.

Los Angeles County, Puente area: Puente Petroleum Co. 1 Jasper Isaacson, 17-2s-9w, dry, TD 3,565 ft., elev. 600 ft.

Monterey County, Cholame area: Standard Oil Co. 1 Hillman, 25-24s-14e, dry in Continental red beds (nonmarine), TD 5,346 ft., elev. 2,390 ft.

Vineyard area: Chanslor-Canfield Midway Oil Co. 1 Silva, 23-24s-12e, dry, TD 5,134 ft., elev. 1,030 ft.

Orange County, Placentia area: Union Oil Co. 1 Placentia Comm., 30-3s-9w, dry, TD 4,487 ft.

Santa Barbara County, Los Alamos area: Pacific Western Oil Corp. 1 Archambeault, 8-7n-32w, dry, TD 3,948 ft., elev. 1,530 ft.

Los Olivos area: Seaboard Oil Co. 4 Seaboard-Barham, 12-7n-32w, dry, TD 6,803 ft., elev. 1,263 ft.

East Olivera area: Union Oil Co. A-1 Sisquoc, 23-9n-32w, dry, TD 2,500 ft., elev. 900 ft.

San Joaquin County, Kings Island area: Shell Oil Co., Inc., 1 Pacific States, 9-2n-5e, dry, TD 5,550 ft.

San Luis Obispo County, Atascadero area: Rocket Petroleum Co. 1 ADS, 26-28s-12e, dry in Cretaceous, TD 1,180 ft., elev. 970 ft.

EASTERN TEXAS

Humble Finds Gas-Distillate In Nacogdoches County

DALLAS.—Humble Oil & Refining Co.'s 1 Thurman Crawford, Pettit lime gas-distillate discovery 2 miles northwest of Trawick, and 14 miles northwest of Nacogdoches, Nacogdoches County, flowed 3,400,000 cu. ft. of gas daily, with a yield of 16½ bbl. of 48°-gravity distillate in 12 hours, flowing through ⅝-in. choke. A later gage, through various size chokes, produced 37 bbl. of distillate in 6 hours, with gas measured at 6,940,000 cu. ft. daily. Production was from the Pettit at 7,498-7,520 and 7,527-40 ft., without acid.

Estimated initial potential had been scaled down on Bobby Manziel 1 Maude Thompson, sub-Clarksville discovery in the Mineola area of Wood County. A 12-hour pumping test early this week recovered 40 bbl. of oil and operators estimated the well would make 80 bbl. of oil in 24 hours, which was considerably under its first indications.

Humble 1-B Tuggle, second producer for Ham Gossett field, Kaufman County, was estimated as good for 100 bbl. of oil a day on the pump, and operators were preparing to complete. In 12 hours of swabbing the Bacon limestone at 6,100-53 ft. it yielded 51 bbl. of oil.

Near Cusetta, in Cass County, Humble 1 Guerin was drilling ahead below 7,336 ft. after coring no shows to 7,278 ft. West of Avinger, W. A. Patterson 1 Connor was drilling below 4,120 ft.

Atlantic Refining Co. 1 M. P. Isom, E. A. Merchant Survey, 7 miles northwest of Hallsville in Harrison County, prepared to core ahead of total depth at 6,425 ft. Tentative base of the Massive anhydrite, by samples, was 6,350-60 ft.

Humble 1 R. P. Barnett, Mary Robertson Survey, 3 miles south of Dixon in Hunt County, was drilling sandy shale below 4,687 ft. Fine-grained sand with no shows was cored at 4,508-17 ft.

W. L. Pickens 1 Mrs. M. E. Black estate, Daniel M. Frisman Survey, 2 miles southeast of Jewett in Leon County, was drilling below 4,070 ft. in shale. It is a new 6,500-ft. Woodbine test.

EAST TEXAS (DISTRICTS 5, 6 & 6-P) WILDCAT FAILURE

San Augustine County: Barnet Petroleum Corp. 2 G. T. Beard, Jacob Garrett Sur., A-15, 1 mi. SE Broaddus, dry, TD 3,031 ft.

MICHIGAN

Mecosta County Test Attracts Attention

MOUNT PLEASANT.—John A. Thompson 1 Cox, NW NW NE 28-16n-10w, Green Township Traverse lime wildcat, Mecosta County, was scheduled to be deepened in the Traverse some 5 ft. after 5-in. casing had been set on a packer at total depth of 2,888 ft. The test showed a steady gas flow from the Traverse of 2,700,000 cu. ft. and oil at a rate of 52 bbl. in 24 hours, or better. This wildcat was the most closely watched well in the Michigan Basin area this week.

Meanwhile, Fisher-McCall Oil & Gas, Inc., 1 Steckle, SE NE NW 6-4n-8w, Carlton Township potential Traverse oil discovery, Barry County, failed to kick off and flow after tubing had been run. A water-cut, believed to be at least partially bottom-hole, was showing when production was reestablished by swabbing and pumping. On the basis of early tests after pump jack was set, the well appeared to be good for at least 60 bbl. Water was showing in varying quantities from 4.6 per cent to less than 1 per cent. Up to the present, the well had produced a total of 546 bbl. of pipe-line oil. Of this amount, 366 bbl. flowed through the 5-in. casing before tubing was run. Traverse top was logged at 2,007 ft. and hole is bottomed out at 2,035 ft. At least three new Traverse tests have been started in Section 6-4n-8w, as a

Dragon Cups tell their story best when in use at the bottom of your wells. Try them.

GET THEM AT YOUR SUPPLY STORE
DRAGON MFG. CO.
Marietta, Ohio

Paddock Sales of Texas
Sales Agent for Paddock Engineering Company of Texas

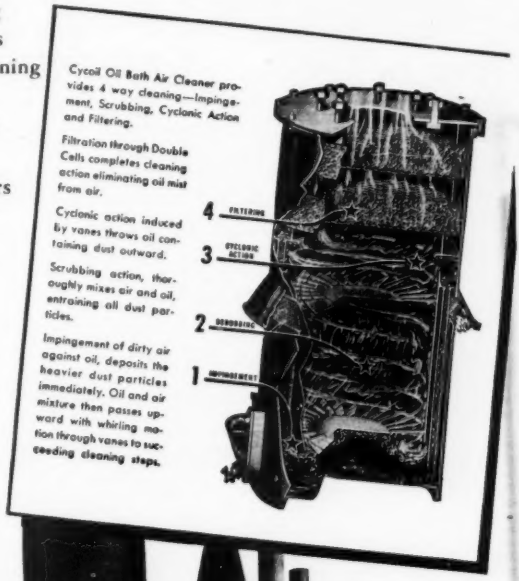
DEATH HOUSE FOR DUST

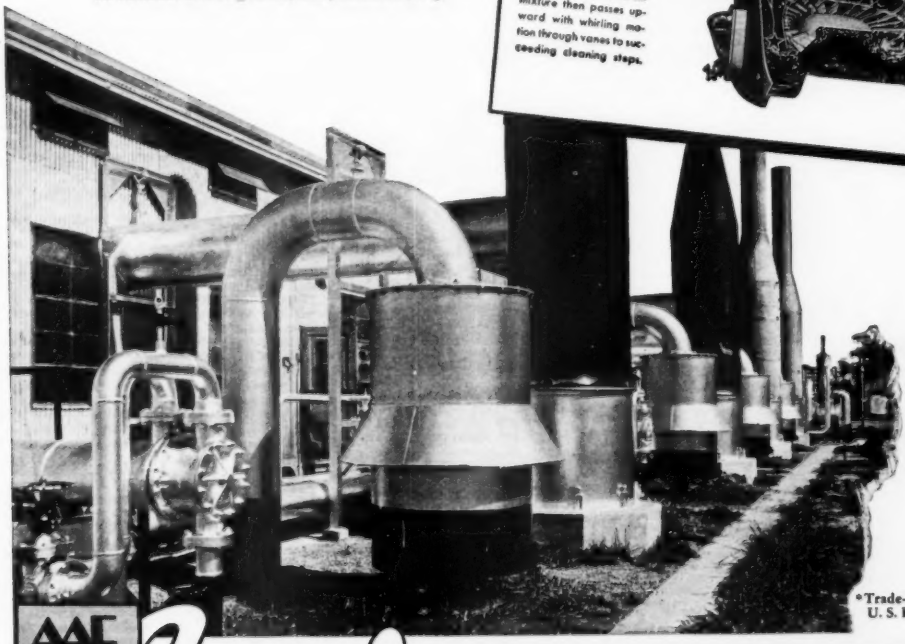
EVERY Cycoil* Oil Bath Cleaner is just that—a death house for dust. And because this unit has been proven a sure cure for engine and compressor dust troubles, it's certain to be a sure source of savings to you.

Cycoil is a heavy-duty unit that's designed not to do just a partial job but to deliver practically 100% dust removal efficiency. Over 90% of the total fine dust content of the air is trapped in a Cycoil before reaching the filter section. The remaining dust then passes to the filter cells where it also is removed. Final result—approximately 100% cleaning efficiency plus positive oil circulation for self-cleaning action and large dust-holding capacity.

Anything less than Cycoil's almost perfect efficiency only postpones the day of costly repairs and shutdowns. If you want to settle your dust problems once and for all—write for Cycoil Bulletin 130-D today.

AMERICAN AIR FILTER COMPANY, INC.
444 Central Ave., Louisville 8, Ky.
In Canada: Darling Bros., Ltd., Montreal, P.Q.


Cycoil Oil Bath Air Cleaner provides 4 way cleaning—Impingement, Scrubbing, Cyclonic Action and Filtering.
Filtration through Double Cells completes cleaning action eliminating oil mist from air.
Cyclonic action induced by vanes throws oil containing dust outward.
Scrubbing action, thoroughly mixes air and oil, entraining all dust particles.
Impingement of dirty air against oil, deposits the heavier dust particles immediately. Oil and air mixture then passes upward with whirling motion through vanes to succeeding cleaning steps.
4
3
2
1



*Trade-mark registered U. S. Patent Office.

AAF® Cycoil® OIL BATH AIR CLEANER
AND INTAKE SILENCER

result of the encouraging pay logged in the 1 Steckle.

MICHIGAN WILDCAT FAILURES

Allegan County, Valley Township: Ohio Oil Co. A-34 U. S. of America CT, NE NE NW 4-3n-14w, Traverse 1,378 ft., dry, TD 1,413 ft.

Martin Township: R. B. Tamblyn Development Co. 1 Cleveland, SW SE SW 33-2n-11w, Traverse 1,544 ft., dry, TD 1,552 ft.

Newaygo County, Big Prairie Township: Sun Oil Co. 5 Consumers Power Co., SW NW SW 28-13n-11w, Dundee 3,052 ft., dry, TD 3,250 ft.

Van Buren County, Almena Township: Wesley A. Moffat 1 Thomas, NE NE SE 21-2s-13w, Traverse 1,222 ft., dry, TD 1,273 ft.

PERMIAN BASIN

Sinclair Gets Discovery In Borden County

MIDLAND — Borden County exploration activity moved back into the highlights this week as field reports indicated an important discovery at Sinclair Oil Co. 1 Sterling Williams, NE NE 45-32-6N-T&P, $10\frac{1}{2}$ miles northeast of the town of Gail, and about 16 miles north of Seaboard Oil Co.'s 1 Good, Canyon limestone discovery. At last report, the prospective pay zone, or zones, had not been definitely identified. First reports called the formation Pennsylvanian, but as additional drill-stem tests added to the indicated pay thickness, various sources placed the first tests in the Mississippian and the latest test in the Ellenburger.

The first good showing was from 9,570-9,650 ft., which recovered 720 ft. of slightly oil and gas-cut mud in 3 hours. A second 3-hour test, from 9,830-78 ft., recovered 1,100 ft. of water blanket, 6,350 ft. of clean oil of around 34° gravity, and 200 ft. of oil and gas-cut mud. There was no formation water. At 9,878-9,928 ft. recovery was 1,000 ft. of water blanket, 7,300 ft. of clean oil and 250 ft. of heavily oil and gas-cut mud, with no water. The well was said to have kicked oil out while pulling the pipe. The above drill-stem tests were tentatively identified as in the Pennsylvanian.

Later reports placed a tentative top, unofficially, on the Ellenburger at 9,940 ft. and classified previous tests as Mississippian. A drill-stem test from 9,940-10,000 ft. showed gas in 37 minutes, and fluid in 95 minutes. It flowed into pits to clean for 55 minutes, then tanked 20.75 bbl. of fluid in 30 minutes, which was said to be mostly 34°-gravity oil. Size of chokes and flowing pressures were not disclosed.

Roberts County.—Sinclair's 1 Lips was last reported making a steady average of 90 bbl. of oil a day, with flowing pressures higher than on previous tests. The company's second test, the 3 Lips, $\frac{1}{2}$ mile north of the discovery, was drilling ahead below 4,106 ft. Operators expected to top the first pay around 5,300 ft.

Gaines County.—Magnolia Petroleum Co. 1 Flanagan estate, east offset to Shell Oil Co., Inc.'s 1 Hawkins, Ellenburger discovery, reported flowing oil on a drill-stem test of the Devonian. The 1 Hawkins also indicated commercial production from the Devonian. Magnolia's well, in SW NW 9-A23-PSL, entered the Devonian at 10,295 ft., said to be about 50 ft. low to Shell's test, and had porous, oil-stained material at 10,-365 ft. A drill-stem test from 10,350-10,405 ft., with 1,000 ft. of water cushion, had flowing oil in 64 minutes. It was allowed to clean into pits for 28 minutes, then gaged 27 bbl. of 33°-gravity oil in 1 hour. Total recovery on the $3\frac{1}{2}$-hour test was not reported. A second test, open 77 minutes, from 10,405-30 ft., recovered 1,000 ft. of water cushion plus 7,530 ft. of oil and gas-cut salt water, estimated to be 10 per cent oil. Southeast $\frac{3}{4}$ mile in Section 12, George P. Livermore, Inc., 1 Joe Head plugged back to 7,800 ft. for completion in the Clear Fork, after finding water in the Devonian.

Upton County.—In the Benedum multiple-pay area, Slick-Urschel Oil Co. 1 H. F. Neal, SE NE 14-$41\frac{1}{2}$-GC&SF, recovered 510 ft. of clean oil, with no water, on a 35-minute drill-stem test of the Fusselman section at 11,043-160 ft. Water blanket came to the surface in 6 minutes, gas in 8 and oil in 10 minutes. The flow was not gaged, but operators said it was equivalent to other Fusselman producers, nearest of which is the Humble Oil & Rerining Co. 1-B Barnett, $1\frac{1}{4}$ miles to the north. Top of the Fusselman at 11,070 ft. in the 1 Neal was said to be considerably higher than the 1-B Barnett. Operators were drilling ahead to the Ellenburger.

Six miles north of Benedum field, Humble 1 Pembrook, Block X, C. C. DeWitt Survey, recovered 230 ft. of slightly gas-cut mud on a 2-hour drill-stem test of the lower Permian at 7,929-94 ft. Drilling continued below 8,050 ft.

Two miles southeast of Magnolia's Ellenburger discovery of Pegagus field, Republic Natural Gas Co. 1 Virgil J. Powell, 44-40-T&P, was drilling ahead below 8,935 ft. after recovering 60 ft. of slightly gas-cut mud on a 1-hour drill-stem test at 8,258-8,332 ft.

Reagan County.—On the southeast end of the Benedum area, Plymouth Oil Co. 1-2 Dixon, 660 ft. from north and 2,526 ft. from west lines, Section 2, Peter Beach Survey 2, extended the field and added a new pay in the Wolfcamp, lower Permian. The well was dry in the Ellenburger at total depth of 12,354 ft. and plugged back to 7,430 ft. From perforations at 7,390-7,430 ft. the well made a pumping potential of $18\frac{1}{2}$ bbl. of 38°-gravity oil a day. Top of pay was 7,400 ft.

WEST TEXAS (DISTRICTS 8 & 7-C) SUCCESSFUL WILDCATS

Runnels County: E. P. Griffin 1 Bryan Clayton, Sec. 138, ETRR Sur., A-763, 11 mi. NE Ballinger, flowed 2,890,000 cu. ft. of gas a day, open 2-in., Gardner sand, 3,800-17 ft., SIP 1,300 psi., TD 3,972 ft., PB 3,835 ft.

Scurry County: Magnolia Petroleum Co. 1 A. B. Eicke, SW SW 209-97-H&TC, $1\frac{3}{8}$ mi. NW 1 Moore, 4 mi. W Snyder, flowed 166 bbl. oil a day, 10/64-in. choke, Canyon, 6,767-78 ft., TD, elev. 2,440 ft.

J. L. Collins i G. E. Parks, CW$\frac{1}{2}$ SW NW 442-97-H&TC, 9 mi. N Snyder, flowed 512 bbl. 41.6°-gravity oil a day, $\frac{1}{2}$-in. choke, Strawn, 7,312-22 ft. TD, GOR 650 cu. ft., elev. 2,386 ft.

Humble Oil & Refining Co. 1-B B. A. Moore, SW NE 492-97-H&TC, 2 mi. NE Dermott, 2 mi. NW N. Snyder Canyon field, pumped 47 bbl. 46.5°-gravity oil a day, plus some water, Ellenburger, 8,200-40 ft., TD 8,405 ft., PB 8,350 ft., GOR 225 cu. ft., elevation 2,611 ft.

Placid Oil Co. 1 Mrs. W. W. Early, 467 ft. from N, 660 ft. from W lines, Sur. 1, Erving, Addison & Walker original Grantee, 6 mi. N, 1 mi. W Snyder, flowed 291 bbl. 39°-gravity oil a day, $\frac{1}{4}$-in. choke, Strawn, 7,520-45 ft., TD 7,548 ft., GOR 430 cu. ft., TP 125 psi., CP 275 psi., elev. 2,390 ft.

WEST TEXAS (DISTRICTS 8 & 7-C) WILDCAT FAILURES

Andrews County: J. C. Barnes 1 P. F. Lawlis, NW NE 22-A47-PSL, Fuhrman Ellenburger area, dry, TD 9,865 ft., Mississippian 9,315 ft., Woodford 9,560 ft., Devonian 9,795 ft., elev. 3,304 ft.

Coke County: Sun Oil Co. 1 Billie Hanks, NE SW 324-1A-H&TC, 3 mi. E Jameson field, dry, TD 6,943 ft., PB 6,000 ft., Ellenburger 6,926 ft., elev. 2,056 ft.

Concho County: Nicholson & Jones 1 Jim Rice, Sec. 18, Indianola RR Sur., A-1413, dry, TD 1,900 ft.

N. B. Hunt and Richard King, Jr., 1 Mrs. Daisy Barr, approximately SW SW 11-TTRR Sur., 10 mi. SE Paint Rock, dry, TD 3,540 ft., Palo Pinto 1,921 ft., Marble Falls 3,140 ft., Ellenburger 3,210 ft., elev. 1,653 ft., had show of gas in Palo Pinto, and oil and gas-cut mud in Ellenburger.

Hale County: Honolulu Oil Co. 1 Nick Alley, NW NW 10-A3-ELRR, dry, TD 8,200 ft., San Andres 2,710 ft., Glorietta 4,000 ft., Clear Fork 4,250 ft., Tubb 5,280 ft., elev. 3,452 ft.

Irion County: Frank & George Frankel 2 Tankersly estate, NW NW 19-GC&F Sur., 10 mi. S Mertzon, dry, TD 7,830 ft.

Humble Oil & Refining Co. 1-F Sawyer Cattle Co., SW SE 191-1-T&P, 8 mi. NW Barnhart, dry, TD 10,144 ft., Ellenburger 9,652 ft., elev. 2,698 ft.

Kimble County: J. R. Stewart 1 Mary Spiller, SW SW SW Sec. 10, W. A. Choice Sur., 18 mi. S Menard, dry, TD 2,465 ft. in the Ellenburger.

Mitchell County: S. F. Hurlbut and Olson Drilling Co. 1 W. L. Ellwood estate, NW SW 17-13-J P. Smith, 12 mi. SE Colorado City, dry, TD 7,622 ft., recovered oil and gas-cut mud on DST at 7,254-84 ft.

Schleicher County: Sorrels Oil Co. 1 J. E Tisdale, NW NW 10-1-HEWT, $4\frac{1}{2}$ mi W Page field, dry, TD 7,026 ft.

La Gloria Corp. 1 Beulah Baugh Ewing, approximately NW NW 15-M-GH&SA 9 mi. NE Eldorado, dry, TD 6,990 ft., Strawn 5,895 ft., Ellenburger 6,400 ft., elev. 2,360 ft.

Sterling County: S. A. Brewster and W. O Bartle 1 I. L. Ellwood, NE NE 77-18-SPRR, 16 mi. NE Sterling City, dry, TD 8,137 ft.

Scurry County: Humble Oil & Refining Co. 1 Luther Edmondson, NE NE NE 437-97-H&TC, 8 mi. NW Snyder, dry, TD 8,405 ft., Ellenburger 8,101 ft., elev. 2,538 ft.

Humble 1-B Luther Edmondson, approximately NW NE 437-97-H&TC, dry, TD 7,205 ft., Canyon lime 7,111 ft., elev. 2,506 ft.

Lone Star Producing Co. 1 M. M. Maule, SE SE 451-97-H&TC, 3 mi. E Dormott, dry, TD 8,297 ft., Mississippian 7,951 ft., elev. 2,560 ft.

Upton County: Samedan Oil Co. 1 A. D Neal, SE SE NW 5 mi. NW Benedum area, dry, TD 6,719 ft., anhydrite 1,230 ft., Yates 2,150 ft., Grayburg 3,795 ft., elev. 2,602 ft.

TEXAS PANHANDLE (DISTRICT 10) WILDCAT FAILURE

Swisher County: Humble Oil & Refining Co. 1 Nanny estate, SE NE 9-OD-S. B. Denwoody Sur., 4 mi. from S, $\frac{1}{4}$ mi. from W County lines, dry, TD 9,658 ft.

SOUTHEAST NEW MEXICO

HOBBS. — Amerada Petroleum Corp. 1-CA State, SE SE 9-10s-36e, southwest of Crossroads field, was nearing its scheduled depth at 12,500 ft. Operators' tentative top on the Ellenburger was 12,329 ft. A 2-hour drill-stem test from 12,326-363 ft. recovered 15 ft. of drilling mud with no shows, and drilling was under way at 12,393 ft. in dolomite material.

Humble Oil & Refining Co. 1-X State, NW NE 31-11s-35e, was drilling at 10,745 ft. in lime and shale. A core from 10,481-486 ft. recovered 4 ft. of shale and 1 ft. of lime, believed to be Permian.

Amerada 1-BTA State, 2-12s-33e, set $5\frac{1}{2}$-in. casing at 11,200 ft. with 200 sacks. A drill-stem test from 11,200-225 ft., total depth, failed in 55 minutes. Recovery was not reported. The company's 1-BTB, NW NW 26-12s-33e, was drilling at 8,476 ft. Tentative top on the Pennsylvanian was placed at 8,470 ft. Elevation is 4,259 ft. Location is 4 miles south of the 1-BTA.

One mile southwest of the 1-BTA, Amerada 1 Caudle in SE NE 10-12s-33e, had total depth at 9,085 ft. and was preparing to run another drill-stem test. A 4-hour test from 8,900-9,030 ft. had gas in 20 minutes, and recovered 1,800 ft. of heavily oil and gas-cut mud. At 9,030-65 ft. gas came to the surface in 5 minutes and after 4 hours recovery was 1,980 ft. of clean 46°-gravity oil, plus 725 ft. of heavily oil and gas-cut mud. On an elevation of 4,256 ft., tentative top of the Pennsylvanian was 8,660 ft.

Phillips Petroleum Co. 1 Sharp, 20-18s-37e, swabbed 7 bbl. of oil plus 43 bbl. of water in 12 hours, with fluid standing around 5,175 ft.

Ralph Lowe 1 Frank Selman, NW SW

11-19s-38e, 2 miles south of Hobbs, was drilling below 7,722 ft. after running several drill-stem tests. At 7,326-99 ft., open 3 hours, gas surfaced in 45 minutes, and recovery was 360 ft. of oil and gas-cut mud. From 7,328-7,415 ft. recovery was 90 ft. of oil and gas-cut mud in 2 hours and 40 minutes. At 7,552-7,630 ft., open 3 hours, gas showed in 19 minutes and recovery was 90 ft. of clean 33.5°-gravity oil, 710 ft. of oil-cut mud, with bottom-hole flowing pressure of 600 psi. Recovery in 3 hours from 7,553-7,665 ft. was 900 ft. of mud-cut oil.

Magnolia Petroleum Co. made location for its 1 Jack Markham in SE SE 11-9s-35e, west offset to its 1 Betenbaugh, Pennsylvanian discovery.

SOUTHEAST NEW MEXICO SUCCESSFUL WILDCAT

Lea County: Stanolind Oil & Gas Co. 1 S. Mattix Unit, NW SE 15-24s-37e, E side Langlie Mattix field, 7½ mi. NW Dollar Hide field, flowed 383 bbl. 45°-gravity oil in 24 hr., 20/64-in. choke, Ellenburger, 9,505-64 ft., GOR 975 cu. ft., CP 350 psi., TP 900 psi., TD 9,705 ft., elev. 3,259 ft.

SOUTHEAST NEW MEXICO WILDCAT FAILURES

Chaves County: H. J. Steinberger 1 H. J. Steinberger, SE SE 33-12s-29e, dry, TD 3,412 ft., San Andres 2,175 ft., Glorietta 3,404 ft., elev. 3,766 ft.

Lea County: Jerry Curtis 1 State, SW SW 1-19s-27e, dry, TD 2,450 ft., San Andres 2,005 ft., elev. 3,496 ft.

Inter-Coastal Petroleum Corp. 1 State, NW SW 1-24s-27e, dry, TD 2,502 ft., Yates 2,337 ft., elev. 3,120 ft.

OHIO, KENTUCKY

Best Gas Well for Year Hit in Muskingum County

COLUMBUS.—The largest gas well of the year for Ohio was drilled in by the National Gas & Oil Corp. on C. G. Longstreth, Section 15, Brush Creek Township, Muskingum County. Clinton sand at 3,825-77 ft. had two pays for a total of 10,416,000 cu. ft. natural.

G. B. Harmon et al completed a third gas well west of the town of Wellington for a ¼-mile west extension. The sand lens was found to be still very thin, coming in at 2,238-41 ft. with a natural open flow of 690,000 cu. ft. The completion is on Stanley Glavich in Lot 34.

Donald Harmon et al finished a nice producer on fee property in Section 2, Washington Township, Monroe County, near the old Rinard Mills pool. Injun sand was topped at 1,552 ft. and drilled to 1,580 ft. with a natural production of 132 bbl. in 36 hours.

Humrichuser et al 1 George Lentzakis, Lot 10, Elyria Township, Lorain County, an addition to East Elyria pool, found the Clinton at 2,351-72 ft. with 829,000 cu. ft. of gas. The well will be tubed natural.

WESTERN KENTUCKY

OWENSBORO.—The prospective pool opener for Union County, J. Burhans, Sam Lewis, and Basin Drilling Co. 1 Addie Y. Lilly, 21-O-19, found water in the lower part of the Waltersburg and operator is now waiting on cement after a squeeze job. The well swabbed at the rate of 40 bbl. of oil and 200 bbl. of water per day before the squeeze. The remaining part of the zone is at 1,842-52 ft. The new well is a little more than 1 mile east of production in South Morganfield pool, opened in March of last year and where the Waltersburg is one of the four pays.

A new well is starting in Henderson County almost on the Kentucky-Indiana line and about 1½ miles south of Evansville. Material is now being moved in at E. L. Johnston 1 A. H. Mann, 22-R-24.

Guffie pool in McLean County has another good Tar Springs well at Miller & Shiarella and Ashland Oil & Refining Co. 4 Smith heirs, 20-N-27, where operator is cleaning out after shot. The well swabbed 150 bbl. from pay at 1,632-50 ft.

In the central part of Ohio County, C. R. Craft and H. H. Vickers 1 Boyd Crowe, 3-L-31, will test the McClosky. Operator has set casing and will acidize zones at 1,438-43 ft. and at 1,470-74 ft.

WESTERN KENTUCKY WILDCAT FAILURE

Daviess County: Basin Drilling Co. and M. P. Evans 1 Bertha C. Cox, NE NE NW 24-O-28, dry, TD 2,047 ft.

EASTERN KENTUCKY

ASHLAND.—In Johnson County, 19-R-79, the deep Knox dolomite wildcat test, Ashland Oil & Refining Co. 8 Wallace Williams, is drilling ahead at 5,183 ft. No information other than drilling depths have been released on this key wildcat which is located on Laurel Creek Dome of the Paint Creek Uplift and is some 12 miles airline northwest of Paintsville, the county seat.

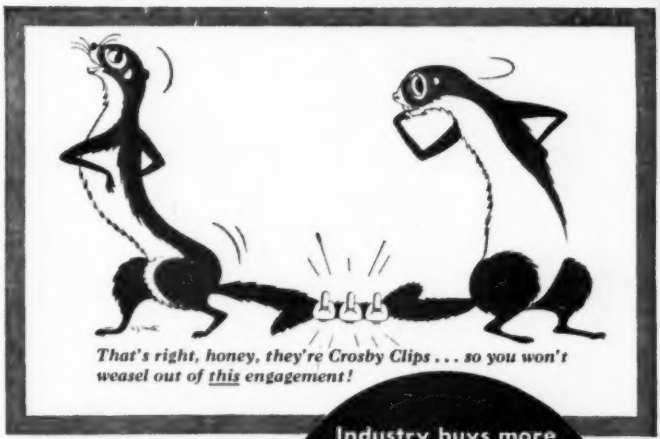
In Lee County, 19-N-69, Jack Kindred is about ready to abandon 1 C. J. Sipple, a rank Knox dolomite test for the region and only the second well in the county to test the Knox formation. Knox, topped at 2,958 ft., was found to be water bearing to a depth of 3,384 ft., at which point drilling is reported to have stopped. No oil or gas shows were noted in the lower formations.

Big Sandy gas field of eastern Kentucky had a dry hole listed for the past week. Kentucky-West Virginia Gas Co.'s 5846 Richard Gains, located on Brushy Fork in Pike County, failed to produce after shooting the Devonian black shale from 2,932-3,660 ft., total depth.

PENBERTHY
EJECTORS

Use the power of steam, air or water under pressure to lift liquids. Being simple jet pumps they have no moving parts and require no lubrication. A variety of models to meet different conditions. Also used as water heaters.

PENBERTHY INJECTOR CO.
DETROIT, MICH. Canadian Plant WINDSOR, ONTARIO



That's right, honey, they're Crosby Clips . . . so you won't weasel out of this engagement!

Industry buys more
CROSBY CLIPS
than all other drop-forged fasteners!
9902

Fasten wire rope with CROSBY CLIPS. Safe, simple, speedy . . . applied anywhere by one man with one wrench. *Drop-forged*, not cast. Hot dip galvanized. All sizes . . . for ⅛" to 3" wire rope. Distributors everywhere; made only by AMERICAN HOIST AND DERRICK CO., St. Paul 1, Minnesota.

ALSO MAKERS OF THE AMERICAN HANDIWINCH AND AMERICAN BLOCKS AND SHEAVES

INDIANA

EVANSVILLE.—Discovery of another new pool in Gibson County is indicated by drill-stem tests made by Gilliam Drilling Co. in its 1 W. R. Stitt, NW NW NW 12-4s-10w. Saturation was found in both the O'Hara limestone at 2,014-18 ft. and the McClosky lime at 2,050-56 ft. and 2,086-94 ft. In a drill-stem test of the O'Hara, with tool open 1 hour, gas showed in 2 minutes and at the conclusion 440 ft. of clean oil was recovered. Bottom-hole pressure of 800 psi. was recorded. In a similar test of the McClosky at 2,047-54 ft., gas showed in 38 minutes and 60 ft. of oil and 66 ft. of oil and gas-cut mud was recovered. Hole was drilled to 2,119 ft. and 5½-in. casing has been cemented at 2,100 ft.

Nearest production is in the Warrentown pool, about 4 miles to the west, which was opened in 1948 by George & Wrather. The latter is producing from the O'Hara found about 200 ft. lower than in the Gilliam well. The new discovery is about 2½ miles northwest of Elberfield. It is in the southeastern corner of the county, only a short distance west of the Warwick County line and north of the Vanderburgh County line.

In the same county, another new pool opener is making production tests on the pump. It Ryan & Sharp 1 Elsie Lewis, SE SE NE 35-2s-12w, about a mile south of the North Owensville pool. In the first 24 hours it pumped 150 bbl. of oil and 100 bbl. of water. Pay also is the O'Hara limestone, in which casing is perforated at 2,478-88 ft. Total depth is 2,567 ft.

Illinois-Mid-Continent Co. and V & S Drilling Co. 1 Nellie Walden, NW SW SE 3-5n-10w, north end of the Oaktown pool, Sullivan County, is pumping 48 bbl. of oil and 2 bbl. of water per day while testing the Salem at 1,850-74 ft. Hole is plugged back to 1,950 ft. from a total depth of 2,897 ft. in the Devonian, which was found non-productive.

East of the Bufkin pool in Posey County, A. J. Slaughter, Jr., 1 Utley, NW SW SE 26-6s-13w, is being completed on the pump for 22 bbl. per day from the Cypress sand at 2,429-33 ft.

INDIANA SUCCESSFUL WILDCAT

Posey County: A. J. Slagter, Jr., 1 E. Utley, NW SW NE 26-6s-13w, IP 18 bbl., Cypress 2,429-33 ft., TD 2,435 ft.

INDIANA WILDCAT FAILURES

Gibson County: Rock Island Refining Co. 1 G. Techenor, NE NW NW 22-2s-11w, dry, TD 2,318 ft.

Ryan & Sharp 1 Scott, SE SW SE 26-2s-12w, dry, TD 2,572 ft.

Vanderburgh County: B. M. Heath 1 Luigs, SW SE NW 5-5s-11w, dry, TD 2,502 ft.

Vigo County: C. M. Coleman and F. M. Friestad 1 Pyramid Coal Co., SW SW SW 35-12n-8w, dry, TD 1,715 ft.

Bottom Water is a drain on profits

Eagle Lead Wool

shuts out Bottom Water!

To insure an uninterrupted flow of oil from your wells, banish bottom water with economical Eagle Lead Wool. This finely stranded metallic wool, tamped around the hole, effectively seals every crack, becomes a permanent, non-corrosive plug. Packed in convenient 50-pound sacks—easy to place in special cartridge-shaped Eagle Wire Containers sized to fit all casings.

These 3 Eagle Bearing Metals meet most requirements

Eagle Dreadnaught — for extreme speed and heavy-duty conditions.

Eagle Outlasta — for medium speed and average-load conditions.

Eagle Durable — for low speed and light-duty conditions.

EAGLE LEAD WOOL

Seals off Bottom Water— keeps 'em flowing!

THE EAGLE-PICHER COMPANY

EAGLE Since EP 1843 PICHER

Cincinnati • East St. Louis Chicago • Dallas • Kansas City

ILLINOIS

Two New Pools Opened By Wildcat Completions

MATTOON.—Completion of two wildcat producing wells, one in Hamilton County and the other in Gallatin County, was recorded during the week. In Hamilton County, Illinois-Mid-Continent Co. and Aurora Gasoline Co. 1 A. M. Thomas, SW SE SW 12-4s-7e, about a mile northeast of production in the Bungay Consolidated area and about the same distance south of the Mills Shoals pool, made 200 bbl. per day from the Aux Vases at 3,338-45 ft. In Gallatin County, George S. Engle 1 D. J. Maloney, SE SE SW 25-8s-9e, a mile south of the Inman pool, was shot with 80 qt. and, on the pump, made 10 bbl. of oil and 20 bbl. of water per day from Tar Springs sand at 2,126-66 ft.

V-T Drilling Co. and S. Gilpin 1 Wilson, SE NE SE 36-7s-9e, prospective pool opener in Gallatin County, flowed 5 bbl. of oil natural. Acidized with 1,000 gal. it made 30 bbl. and went to water. Efforts now are being made to plug off the water with plastic. The well is in the McClosky lime at 2,820-30 ft. It is 2 miles northeast of the North Inman pool and about 3 miles east of the Cottonwood pool.

The new Waltersburg sand pool, opened a week ago near New Haven, White County, by George & Wrather and Barclay Oil Co. and associates 1 Garrison, is getting a confirmation well in Sohio Petroleum Co. 1-B Roy Pearce. The latter, located in the SW NE NE 3-7s-10e, is a 10-acre diagonal southeast offset to ths discovery well. Testing the sand at 2,136-50 ft., it flowed 50 bbl. of clean oil in the first hour. The discovery well, with the sand at 2,154-64 ft., was completed on the pump for 450 bbl. per day. The new pool is about a mile east of the Concord Central pool.

Production in the active Assumption North pool in Christian County is being extended further northwest by Collins Brothers Oil Co. 1 Edith Sherman, SE NE SE 4-13n-1e, which is being put on the pump after swabbing 25 bbl. per hour natural from the Rosiclare sand at 1,082-92 ft. A twin well, 1-A Edith Sherman, also is expected to extend the field's Devonian pay following a drill-stem test in which 1,700 ft. of clean oil was recovered. Casing (5½-in.) has been run to 2,301 ft. with bottom of the hole at 2,310 ft.

ILLINOIS SUCCESSFUL WILDCATS

Edgar County: T. T. Groff 1 Clapp, SW SW SE 33-3n-13w, IP 2 bbl., Pennsylvanian 557-67 ft., TD 568 ft.

Hamilton County: Illinois-Mid-Continent Co. 1 A. M. Thomas, SW SE SW 12-4s-7e, IP 170 bbl., Aux Vases 3,336-44 ft., TD 3,345 ft.

ILLINOIS WILDCAT FAILURES

Douglas County: H. C. Sanders 1 Walter

Huckabee, S½ SE SW 25-15n-7e, dry, TD 1,797 ft.

Franklin County: Illinois-Mid-Continent Co. and Aurora Gasoline Co. 1 Morgan, NE NE NE 16-5s-1e, dry, TD 2,940 ft.

Hamilton County: Phillips Pet. Co. 1 Johnson, NE SE NW 28-6s-5e, dry, TD 3,425 ft.

Madison County: F. R. Stocker 1 Brose, SW SW SW 16-5n-7w, dry, TD 2,269 ft.

Montgomery County: Stewart Oil Co. 1 H. L. House, SE NE SE 29-10n-3w, dry, TD 1,005 ft.

Richland County: W. F. Lacy 1 Hoenggi, SW SW SE 13-3n-10e, dry, TD 3,365 ft.

Washington County: T. B. Dirickson 1 Jollenbeck, SW SW NW 32-1s-4w, dry, TD 2,390 ft.

White County: Blumgren & Whitt 1 S. Trusty heirs, SE NE SW 5-7s-9e, dry, TD 3,228 ft.

APPALACHIAN FIELD

Deep Pennsylvania Wildcat Planned in Fayette County

PITTSBURGH.—In Wharton Township, Fayette County, Pennsylvania, W. E. Sneed is clearing off location for his 3 Indian Creek Coal & Coke Co., deep wildcat on Chestnut Ridge approximately ½ mile southeast of the Kirby well completed several years ago as a light gas well in the Onondaga chert. In Unity Township, Westmoreland County, Peoples Natural Gas Co. 1-3830 W. Piper, elevation 2,061 ft., Onondaga chert 8,158 ft., reported a show of gas at 8,223 ft., gaging 100,000 cu. ft., and is drilling at 8,294 ft. A good gas well in deepening operations was struck in West Bethlehem Township, Washington County, at Robert Murray et al 1 I. W. Iams, testing 1,591,000 cu. ft., total depth 1,986 ft.

In Portland district, Preston County, West Virginia, Hope Natural Gas Co. 9315 P. S. Pyles, elevation 2,197 ft., is being plugged and abandoned after unsuccessful acidizing in the Oriskany sand. The original gas tested 300,000 cu. ft. but after acidizing decreased to 78,000 cu. ft. Total depth is 6,086 ft. In Loudon district, Kanawha County, Owens-Libbey-Owens 20-769 Great Kanawha Petroleum Coal & Lumber Co., elevation 1,104 ft., was completed in the white Medina, which was topped at 6,038 ft., and gas at 6,073-79 ft. gaged 564,000 cu. ft. with a rock pressure of 1,680 psi. in 20 hours. Total depth is 6,084 ft.

WEST VIRGINIA SUCCESSFUL WILDCAT

Kanawha County, Loudon district: Owens-Libbey-Owens 20-769 Great Kanawha Petroleum Coal & Lumber Co., 564,000 cu. ft. of gas, Corniferous lime 4,639-4,751 ft., sand 4,751-58 ft. and 5,396-5,414 ft., show of gas 5,399-5,401 ft., white Medina sand 6,038-84 ft., gas 6,073-79 ft., TD 6,084 ft.

WEST VIRGINIA WILDCAT FAILURE

Preston County, Portland district: Hope Natural Gas Co. 9315 P. S. Pyles, dry, TD 6,086 ft., Corniferous lime 5,669 ft., Oriskany sand 5,858-6,063 ft.

Mexican Strike Threatened

A general strike of oil workers threatened Petroleos Mexicanos, the Mexican Government oil agency, last week. Eulalio Ibanez, head of the oil workers executive committee, declared a strike involving some 50,000 workers would be called if demands for a wage increase aggregating approximately 350,000,000 ps. (about $43,500,000) annually are not met. A new contract is now being negotiated.

COMPOUNDED and PRESCRIBED to PREVENT GALLED THREADS

Unless thread compounds are treated very much like physicians' prescriptions, they don't contain *all* properties required for complete protection against galling. A haphazard mixture *won't do* the job.

At WECO, thread compounds *are* treated like prescriptions. Carefully selected materials, each chosen for its ability to perform a certain vital function, are skillfully blended into compounds of the highest protective quality. Pure metallic bases . . . zinc in WECO No-Gall, lead in WECO Steel-Aid . . . are held in solution by neutral oils and grease binders that prevent any tendency to harden; tacky additives provide for adherence to wet, slick joints. *No compressible fillers are employed.*

GET THE FACTS on thread compounds from your WECO representative. He can show you why WECO compounds . . . Steel-Aid or No-Gall . . . provide unequalled protection. He'll also be happy to tell you about WECO Hi-Speed Seal, a permanent, non-hardening seal for casing, tubing and other threaded connections.

WECO THREAD COMPOUNDS ARE AVAILABLE AT YOUR SUPPLY STORE

WELL EQUIPMENT MFG. CORP.
Subsidiary of Chiksan Company
Houston 1, Texas
Exclusive Sales Representative Outside Mid-Continent Area
CHIKSAN COMPANY
Brea, Calif. New York 7
Export Sales: CHIKSAN EXPORT COMPANY, Brea, Calif. New York 7

WECO
Manufacturers and Distributors of Oilfield, Refining, Marine and Industrial Equipment

Empire Trust Company

NEW YORK

Capital Funds.....$9,195,675.26
Total Resources $130,626,276.03

Directors

DEAN MATHEY
Chairman of the Board
FRANK V. BALDWIN
Retired
C. KENNETH BAXTER
Chairman of the Board
Deep Rock Oil Company
JOHN T. CAHILL
Cahill, Gordon, Zachry & Reindel
EVERETTE L. DeGOLYER
DeGolyer & MacNaughton
Dallas, Texas
GEORGE A. EASLEY
Vice President, Salt Dome Oil Corp.
DEAN S. EDMONDS
Pennie, Edmonds, Morton
& Barrows
CHARLES S. GARLAND
Alex, Brown & Sons
Baltimore, Maryland
ARCHIBALD A. GULICK
Alexander & Green
PAUL H. HUDSON
Executive Vice President
and Secretary
GEORGE S. LEISURE
Donovan, Leisure, Newton, Lombard
& Irvine, New York
JOHN L. LOEB
Partner, Carl M. Loeb, Rhoades
& Co.
GRAHAM D. MATTISON
Dominick & Dominick, New York
HENRY C. BRUNIE
President
DONALD H. McLAUGHLIN
President, Homestake Mining Co.
JULIAN S. MYRICK
Vice President
Mutual Life Insurance Co.
CLENDENIN J. RYAN
President, Big Horn
Cattle Co. of Colorado
ARTHUR A. SEELIGSON
President, Transwestern Royalty Co.
San Antonio, Texas
JAMES H. VAN ALEN
Vice President, Farrar, Straus
& Co., Inc.

Specialized experience in the financing of oil, gas and other natural resource properties.

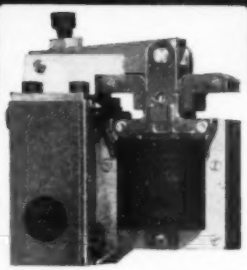
Main Office
120 BROADWAY, NEW YORK

Fifth Avenue Office
580 FIFTH AVENUE

MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

Condensed Statement of Condition, Dec. 31, 1948, available upon request.

NEW HIGH PRESSURE
SOLENOID VALVES
Features



- Rugged compact construction
- 3000 P.S.I. operating pressure
- Continuous duty
- Poppet design eliminates leakage
- May be mounted in any position
- Impregnated coils resist moisture and condensation

FOR 110-VOLT
60 CYCLE A.C. CURRENT

Waterman High Pressure Solenoid Valves are inexpensive, compact units designed for continuous duty in hydraulic systems where pressures are as high as 3000 P.S.I. Poppet type construction gives positive sealing against internal leakage. Impregnated oil resistant coils make these valves suitable for mounting in oil reservoirs. In many cases this feature eliminates costly piping and makes possible the construction of smaller, more compact hydraulic power units. Available in ⅜" pipe size. Electrical requirements are 110 volt—60 cycle A.C. current.

West Coast: 918 Kenilworth Ave., Glendale 2, Calif.

WATERMAN ENGINEERING Company
721 CUSTER AVENUE
EVANSTON, ILLINOIS

MARMAN

...stops leaks when the pressure is on

Marman High Pressure pipe leak clamps withstand pressures of 1,000 p.s.i. without leaking. As a permanent repair for high pressure pipe in sizes from 2" to 8" this clamp is unexcelled. Here are some of the reasons.

- Perbunan pad resistant to gas, oil, water, gasoline, etc.
- Stainless steel patch plate contoured to give maximum sealing pressure.
- Stainless steel band for high strength and corrosion resistance.
- No loose parts—integral bolts trunnions and patch plate.
- Easy positioning—patch plate movable allowing take up bolts to be positioned as desired.

For information write Dept. O-6

MARMAN PRODUCTS CO. INC.
940 W. FLORENCE AVENUE
INGLEWOOD, CALIFORNIA

FPC Members Now Approve Exempting Some Gas Producers

WASHINGTON. — Members of the Federal Power Commission recommended this week that Congress amend the Natural Gas Act to exempt from FPC control producers and gatherers with gross sales not exceeding $100,000 a year, or, alternatively 2,000,000 M.c.f. of natural gas.

The proposal for a $100,000 exemption was offered by Commissioner Claude L. Draper, testifying June 7 before the Senate interstate subcommittee in charge of the Kerr bill. The 2,000,000 M.c.f. suggestion was made by Thomas C. Buchanan, whose nomination as a member of the commission had been confirmed by the Senate the preceding day after Sen. Edward Martin of Pennsylvania had unsuccessfully sought to defeat it and Sen. Francis J. Myers of the same state had defended the nominee.

Both commissioners were given a thorough workout by the subcommittee, particularly Draper who, after asserting that the knowledge that the commission has authority over independent producers, even though it did not assert it, would have a "salutary" effect toward keeping field prices down, was forced by Sen. Ernest W. McFarland of Arizona to admit that this was, in effect, "Rule by Fear."

Draper declared he had no doubt as to the commission's authority in view of the Supreme Court decision in the Interstate case in 1947, and expressed the belief that the commission's Order 139, announcing it would not assert authority over independent producers, was a mistake on the ground the commission could not make the law but was limited solely to its enforcement.

The commissioner told the subcommittee Congress should make it clear that the FPC has authority over independent producers, but Buchanan asserted no action was necessary since the court, in interpreting the act of Congress, had made it clear that such authority existed.

Draper asserted that the commission has done a good job of regulating the natural-gas industry without control of production but needs that authority as a "police power" in the event there are any unlawful rates charged.

Buchanan explained that the exemption of independent producers selling not more than 2,000,000 M.c.f. of gas a year would take out from commission control 2,230 of the 2,300, producers and gatherers whose regulation would cost more than the results justified. The remaining 70 producers, he said, account for 75 to 80 per cent of the natural gas sold to interstate pipe lines.

The new commissioner declared that Order 139 is meaningless since the commission is without authority to attempt to change an act of Congress or a decision of the Supreme Court.

Louisiana's Conservation Commission Meets June 15

BATON ROUGE.—The next statewide hearing of the Louisiana Conservation Commission will be held at the Monteleone Hotel, New Orleans, on June 15.

The commission will receive evidence from producers and purchasers of crude and natural gas relative to market demand in preparation for setting July and August allowables.

FRANK W WHEATLEY

Feature of the Week

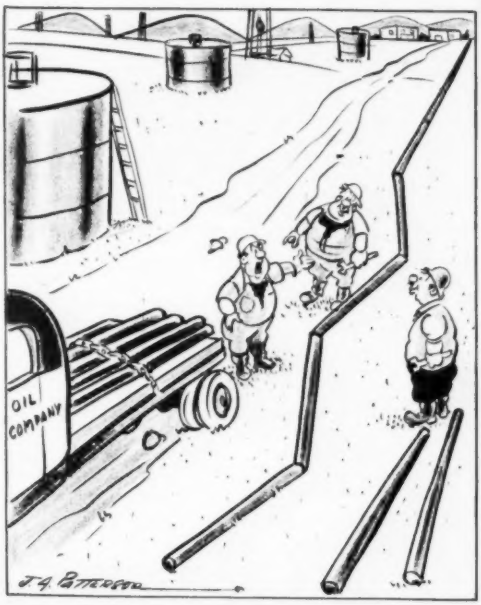
UNDISPUTED FOR COMPLETENESS OF LINE

Reciprocating Power Pumps from 10 to 300 H.P. Pressures up to 8,000 lbs. Volumes up to 40,000 B.P.D. Direct and V-Belt driven . . . Portable and Stationary . . . Oil - Mud - Acid - Salt Water - Water Flooding.

When It Comes to Pumps, Come to Wheatley

Frank Wheatley Pump & Valve Mfr.

Hale Station, Sand Springs Road, Tulsa, Oklahoma



THE OIL AND GAS JOURNAL

"Just how many beers did you birds have when you went to lunch?"

JOHNSTON TESTS THE DEEP ONES!

WITH THE HELP OF MURRAY-MOLDED RUBBER

The Johnston Formation Tester functioned perfectly and released easily after tests were completed in open hole at 13,514 feet.

Working below 17,000 feet inside 7" casing, the Johnston Casing Tester obtained results on every run.

Here is a perfect example of how Murray works with oilfield equipment manufacturers to mold the right rubber for specific jobs.

In the Johnston Formation Tester, natural rubber proved the right rubber for the packing element. In the Johnston Casing Tester, a special Neoprene compound was selected for the rubber component because of its ability to resist oil, gas, acids and heat.

Like many of the industry's leading equipment manufacturers, Johnston found the solution to their rubber problems at Murray—one of the nation's largest producers of mechanical rubber goods, augmented by complete engineering and machine shop facilities for the design and manufacture of customer's molds, dies, metal inserts and custom machine work. We invite you to make use of Murray's expanded facilities to solve your rubber problems.

MURRAY RUBBER CO.

HOUSTON, TEXAS

Murray Rubber

International

WORLD-WIDE OIL DEVELOPMENTS

International Bank Will Make Survey of Colombia's Economy

WASHINGTON.—The International Bank for Reconstruction and Development will send a mission to Colombia toward the end of this month to make an over-all economic survey of the country at the request of the Colombian Government, and while officials said it is too early to determine whether the oil industry will be studied they admitted that it might well be included in the mission's program.

The Colombian survey is one of three or four which the bank expects to make this year at the request of the governments of other countries. None of those now under consideration, however, will involve oil, it was said.

Bank officials emphasized that there is a difference between making surveys and making loans for industrial expansion, and pointed out that oil exploration and development always has been considered a speculative activity which the bank could not properly finance. The nearest it ever came to getting into the petroleum field, it was said, was a few years ago when Mexico asked for aid in developing its pipe lines. A study was made but the loan Mexico actually received was for hydroelectric development.

Technical Skill Stressed

The bank's announcement of the Colombian study stressed the interdependence of technical knowledge and sound investment, explaining its experience has shown that deficiencies in technical skills and experience are often an even more serious handicap to economic development than a lack of capital.

The making of analyses of the new development problems and potialities for member governments is not a new activity of the bank, which up to now has sent missions to 19 countries in Latin America, Asia, and Africa.

The technical assistance available from the bank is of three general types. It is prepared to help its member countries in making comprehensive surveys of their resources, in working out long-term investment programs, and in evolving administrative and financial measures; it will work closely with potential borrowers in analyzing and planning specific projects for bank financing, particularly in the fields of industry, power, and transportation, which are not the responsibility of any other international specialized agency and involve particularly heavy investments of capital; and it is prepared to assist in devising and putting into effect practical measures to strengthen the financial institutions and practices of its member countries and to encourage productive investment from other sources.

Contract for Dehydration Plant in Argentina Let

A contract for the engineering for and procurement of a dehydration plant for the 1,200-mile natural-gas line being built by the Argentine Government has been awarded to the chemical-plants division of Blaw-Knox Co.

The dehydration plant will be erected at the Comodoro Rivadavia pumping station, in southern Argentina. Cost of the plant is estimated at $125,000.

Dutch Will Stage Congress

The 1951 World Petroleum Congress is to be held in the Netherlands, and, according to a report from The Hague, the Royal Institute of Engineers there has received a request to organize the Congress. It was held first in London in 1933, and the last time in Paris in 1937.

Germans Make Discovery Close to Dutch Border

PRELIMINARY production tests on the new German discovery, 2 Ruehlertwist, near the Dutch border, indicate a productivity of from 50 to 94 bbl. daily.

The wildcat, located 12 miles northwest of Lingen in the Emsland area, is considered opening up a new German field as an extension of the Coevoorden-Schoonebeek area on the Dutch-German border to the west *(The Oil and Gas Journal, May 12, page 60)*.

Reports from Germany said the preliminary tests confirmed the expectations raised by the first core analysis. Production was from a depth of 2,428-61 ft., and the well is now being deepened.

Reflection seismograph work indicates that the producing area will extend in an east-west direction. The operator is the Wintershall, A.G., with three other German companies, Gewerkschaft Elwerath, Preussag, and C. Deilmann, also interested in the concession. The companies were said to be planning other wells in order to gain information on the reservoir and determine the most appropriate plan of production.

A.I.O.C. Buys Austrian Distribution Facilities

Phoenix Oil Products, Ltd., in London has announced an agreement on the sale of the company's German and Austrian properties to Anglo-Iranian Oil Co., Ltd. Properties involved are marketing and distribution facilities. Anglo-Iranian is to pay £185,000 (about $750,000) on proving of Phoenix's pre-1938 right to the Austrian business. Phoenix's Belgian properties also have been sold for some £74,000 (about $300,000).

Poles Get "Alky-Gas"

BAB, a mixture containing 60 per cent gasoline and equal amounts of alcohol and benzol, is being introduced in Poland as the standard fuel for motor vehicles, according to the Warsaw Radio.

Pioneer in Drilling

Brantly Keeps Tab on Worldwide Operations

by Eric G. Schroeder

Drilling & Exploration Co., with headquarters in Dallas, Tex., has had a hand in the development of petroleum in virtually every corner of the globe, but its president, J. E. Brantly, pictured at right, is little more than a name to most oil men. This article gives some interesting sidelights on the personality of the founder and driving force behind this far-flung enterprise.

THE big man in impeccable dress is lunching on a sandwich at his desk in the Dallas office. His large, expressive hands ceaselessly finger letters, reports, and memoranda. His mental and digestive processes are compounded like two oil-field pumps when there is tough digging.

The phone! Buenos Aires on the line.

In cultured, southern diction he reviews affairs with a company man near the end of the earth. Suddenly he is conversing with an easy flow of words in Spanish. Ing. Landoni, director of Argentine Y.P.F., has the receiver at the other end. They talk of equipment to be used in drilling from the Bolivian border to Tierra del Fuego.

Almost as the receiver clicks the big man is signing "J. E. Brantly" in a bold hand over the word "president" on stationery of Drilling & Exploration Co. Before the day is ended he will talk to Bahia, La Paz, Contamana, and even Ankara.

He has a genius for detail. His mind pigeonholes information into an orderly storehouse from which it can be withdrawn at an instant's notice. Global circuit rider, industrialist, author, engineer, and inventor—talents blend with such nicety as to leave no trace where one begins and the other leaves off.

Started as Miner

The background for his accomplishments goes back to his formative years—even further. It is based on heritage traceable for at least three generations. There are two branches of plantation folk, one of teachers, and one of industrialists among his forebears. The genes of all the generations made a grand slam in Ned Brantly.

He was born in Macon, Ga., on June 25, 1892. At 8 he moved with his mother and brother to Tuscaloosa, Ala. At 18 Ned had a major in geology and degrees in engineering and mining from the University of Alabama.

He taught briefly at his alma mater and had a fling at managing some properties for his stepfather. But there was too much static in that sort of thing. Ned hired out on the timber crew of a copper company for $1.50 per day and worked 1,200 ft. underground. Saturday nights and Sundays he earned money by mucking.

Georgia wanted an assistant state geologist. Young Brantly took that job for 3 years and wrote several bulletins on formations and drainage.

He was about 24 when World War I came along. He earned a commission in field artillery at Camp Zachary Taylor. After the Armistice he set out for the Fort Sill school of fire. But the zip was gone. In about a month he quit.

Fate dealt a hand. It was mainly composed of Buck Lewis, who was Ned's buddy, and a Lawton attorney whose name is forgotten. Anyway, Buck went with the attorney's daughter and Ned went along with Buck. The lawyer had some oil wells and drove the young officers out to see them. They fired Ned's imagination. He set out for petroleum headquarters at Dallas.

Ned had a letter to E. R. Brown, Magnolia head, from the latter's nephew. Brown said that Magnolia used no geologists. He introduced his visitor to Dave Faulkner, production head, who offered roughnecking at Burkburnett.

But Dr. Robert T. Hill, prominent Texas geologist, needed a leg man and made short work of weaning over the tall youngster to fill the bill. The clan gathered in their Dallas office to discuss black gold. Bob Penn, oil editor of the News, was often there. So were Bill Wrather and Dorsey Hager.

International

R. S. McFarland joined the firm. After a year and a half Brantly had itchy feet. He wanted foreign service. He went to Mexico for Marland Oil Co. under C. E. (Ed) Hyde, now a Fort Worth operator. Six months later Brantly headed Mexican studies for Sun Oil Co. That was 1921.

He had resigned from Sun when he met W. M. Irish II, president of Atlantic Refining Co. of Philadelphia. Irish made Brantly chief geologist primarily for foreign affairs. That fed his wanderlust. He served in Mexico, Venezuela, Colombia, Cuba, and the southern Mid-Continent. He picked C. R. (Chuck) Rider from Shell and sent him to Venezuela in charge of operations.

Drilling interested Brantly. He studied economizing. He is inventive. He devised rotating equipment, special draw works, and was the first to use them separately.

The industry respected his ability. Friends suggested that Brantly and Rider organize a drilling company. Among them were Chester M. Crebbs of Gulf and N. O. Watson of Shell. So Drilling & Exploration Co. was formed in January 1929.

The first rig operated in Venezuela for Shell. It was a good start but

work ran out. After 2 years the new operators headed for East Texas where they took a whirl at contract drilling for oil paper. E. B. Germany and Tom McGrain hired them. So did Bob Goodrich. Then drilling shut down.

Brantly went to California to study operations at Kettleman Hills. He still wanted to reduce costs. He wangled a contract for a series of wells and set up the first heavy-duty balanced rig good for 12,000 ft. Drilling and completion time was cut from 12 to 4½ months. By this time D. & E. included Gilbert E. Peterson as treasurer and Edwin B. Hopkins and Harold J. Wasson, New York geologists, as stockholders.

In California Brantly developed the "feed control" and high-speed rotation. He added rigs, 10 strings in all, and developed new methods and devices. In his spare time he wrote. The Rotary Drilling Handbook was published in 1936. The fifth edition is in preparation today.

Brantly started a steam rig 3,000 miles up the Amazon in 1937 on an eastern Peru contract. The boat hit a log and sank with 400 tons of equipment. The owners salvaged a fourth of it, replaced the rest, spudded in, and eventually made an oil field.

D. & E. was drawing attention. Brazil made contracts in 1939 for areas near Bahia and Macieo. Rigs are still running there. Five small fields produce oil and three produce gas.

Peru and Paraguay provided more work. Then in 1947 the Turks scented oil. Early the next year D. & E. had finished the first well for the Ottomans. There will be many more.

Organized Drilling Contractors

There are no covert approaches in making deals. Brantly knows only one recipe. Give the best service possible at a reasonable price. He holds the same idealism for his contemporaries. As evidence, mark the part he had in organizing the American Association of Oilwell Drilling Contractors in 1939. He served as its president for the first 2 years.

But there is something besides oil in Brantly's veins. It is of the earth. He loves the soil. He has acreage near Cocoa, Fla., also on the Suwannee River, and he owns a farm close by Athens, Tex. He doesn't want fertile land—unless he makes it that way.

There is a curious side to his character that leads him at times to achieve seclusion so that the self-completeness within his soul can feed upon solitude and be happy. However, he is in his element amidst the hibiscus, bougainvillaea, and coconut palms of Rocio del Mar, his Cocoa Beach estate. Indian River grapefruit from his trees and others in that belt are among the finest produced.

Hunting, fishing, and sailing are part of each day's pastimes, with swims in the surf and even beachcombing thrown in. Guests for dinner are likely to eat a complete meal prepared in the cabana by the man who bosses 500 Americans and several thousand foreigners—right down to the onion slicing. When he relaxes it is with mental pursuits, heavy reading. On long flights to far places he often composes blank verse that is lofty, wistful, full of the country he is traversing.

He married Lucy Lyman Powell of Birmingham in 1920 and they have twin sons, both in their father's business. Ned, Jr., lives in Bahia; McGehee in Abilene. The big, white, Florida house with its cypress trim and beams, red tile floors, and easy verandas, is the family home. It exudes hospitality. The setting embodies the Old South with a lovely, languorous air and "Marse Ned" in the title role.

Whether in the big, paneled office at Dallas or among the sun-swept stretches of his Florida acres, wherever he is at any moment, Ned Brantly's hands or brain are never idle. But drilling for oil comes closest to being his favorite activity.

"I think," he muses, with that half-quizzical look his eyes assume, "if I had my choice of all the things I'd like to do, I'd be a tool pusher."

Exploration Remains Active in Venezuela; Fewer Rigs Running

THE current trend of exploratory activity in Venezuela is indicated by reports showing a further drop in the number of rigs running but, on the other hand, a slight increase in the number of geological and geophysical parties in the field.

Most Venezuelan operators, because of production cutbacks following the declining demand for heavy fuel oil, have curtailed actual drilling programs. At the same time, the less-expensive nondrilling exploratory work is continuing with little change from the high levels of last year, according to one company official.

Exploratory effort of both kinds, drilling and geophysical, is being centered in Western Venezuela. Here the companies are seeking the deeper Cretaceous pays yielding the lighter-gravity oil.

New Concessions Eyed

There is considerable interest over the possibility that the Venezuelan Government will receive bids this summer and possibly award new concessions for the first time in several years. A commission was set up several months ago by the new government to recommend changes in the country's oil policy.

It also is reported that two companies are now being organized with Venezuelan capital to enter the oil business and they are expected to be active in any opening up of new concessions.

Regarding the present status of exploration and development drilling in Venezuela, a total of 126 rigs were reported operating in the country as of May 1. Of these, 57 are in Western Venezuela, including 33 on field wells, 21 on exploratory wells, and 3 on workovers and cleanouts. Of the 69 operating in Eastern Venezuela, 41 are on field wells, 18 on exploratory wells, and 10 on workovers and cleanouts.

The total of 126 rigs compares with 138 in March 1949, 151 in December 1948, 140 in November 1947, and 125 in November 1946. Of the present 57 rigs running in Western Venezuela, 3 are drilling deeper pool wildcats, presumably seeking the Cretaceous.

Data on geological and geophysical parties working in the field show 64 parties in March of this year compared to 63 in February and 59 in January. Of the total number of parties in March, 25 were seismograph, 12 gravity meter, 23 field geological, and 4 structural drill. The figures are not divided by areas.

The drop in rigs running is further shown in Creole Petroleum Corp.'s company report for March. Creole, which accounts for some 40 per cent of the production in Venezuela, had an average of 25.5 rigs running during the month compared to 32 the latter part of last year. Of the wells drilled, nine were producing development wells. Area, average initial production, and average depth of the three wildcats were: Cumarebo, 75 bbl. daily, 3,515 ft.; Mulata, 359 bbl., 5,600 ft., and Pedernales, dry, 12,150 ft.

Creole's operated production during March averaged 475,919 bbl. daily, a drop of 59,724 bbl. daily from the previous month. Of the March output, 333,440 bbl. came from the Maracaibo (Western) area, 4,200 bbl. from Cumarebo, and 138,279 bbl. from Eastern Venezuela. March runs at the Caripito refinery were 55,426 bbl. daily, and 7,787 bbl. daily at La Salina.

Argentina Shuts Out U. S. Oil With British Trade Agreement

THE newly signed Argentine-British trade agreement providing an oil-for-meat barter arrangement threatens to exclude American-produced oil from the largest petroleum consuming country in Latin America.

Officials of the United States companies took an extremely serious view of the situation, and it was known that discussions were under way in Washington with government officials over the matter.

The development was regarded as one of the first major dislocations in world petroleum trade resulting from dollar shortage problems. The recovery program has preserved much of the normal trade pattern in Europe.

Reports from Buenos Aires said that under the agreement Britain would supply Argentina with some 5,700,000 tons (about 115,000 bbl. daily) of liquid fuel. Argentina now produces about 67,000 bbl. daily, and it appears that the shipments of oil under the trade accord will fully satisfy Argentina's import requirements.

The agreement, which extends over a 5-year period, was announced May 31 in Buenos Aires. It has been under negotiation for several months. Reports of its terms were sketchy, and full details were not known.

Argentina has for years been an important market for oil produced by American companies elsewhere in Latin America. Last year there was decided shift to more petroleum imports which could be paid in sterling. Estimates are that in 1948 Argentina's imports were about half dollar and half sterling oil.

Crude Is Chief Import

The principal American company in the Argentine market is Standard Oil Co. (N.J.) through its affiliates. It shares leadership with the Royal Dutch-Shell organization producing sterling oil. Other American companies with interests in the Argentine market are Socony-Vacuum Oil Co., Inc., and The Texas Co.

Since Argentina has the capacity to refine the major part of its petroleum requirements, the largest item in the imports under the British-Argentine agreement presumably will be in crude oil. It was reported from Buenos Aires that 1,800,000 tons of the 5,700,000 tons annually would be crude.

Argentina needs to import considerable quantities of heavy fuel oil, and excluding this item, it is estimated that its domestic refining capacity would handle 80 to 85 per cent of the remaining requirements.

Other product imports would be in large part kerosine and distillates.

Oil to be supplied by the British under the agreement is expected to come from the production of Anglo-Iranian Oil Co., Ltd., and the Shell organization. These companies are classed as sterling producers; the American oil companies are not now allowed to trade generally in sterling under British government regulation. Some oil has been shipped during the past year from the Middle East to Argentina.

Elimination of dollar oil from the Argentine market has been expected in view of the country's extreme shortage of dollar currency. The new trade agreement in effect ended the traditional method by which Argentina accumulated heavy sterling balances which were converted to dollars for purchases in the United States. Under the agreement, trade will be about at parity through the British exports of petroleum and other items such as machinery, textiles, and whiskey. The British will receive principally meat but also grain, linseed oil, and forage.

This parity feature stems out of Britain's efforts to halt the drain on its dollar resources. Argentina is stepping up its own exports to the United States to obtain a more favorable balance. Last year United States purchases from Argentina were less than half of its sales to that country.

Whether the machinery to be sold to Argentina by the British under the agreement includes oil equipment was not known. Some small quantities of British equipment have recently been taken by Argentina since its dollar balances do not favor large United States purchases.

Pemex Makes Discovery in Isthmus Area; High-Gravity Crude Reported

PETROLEOS MEXICANOS, the Mexican Government oil agency, has announced a new discovery in the State of Tabasco in the Isthmus area as a result of the completion of its 1 Fortuna Nacional.

The well was reported to have produced initially approximately 1,000 bbl. daily of high-gravity oil with a large gasoline content. The well was taken to about 2,000 m. (6,500 ft.) with the producing horizon at 1,611 m. (5,300 ft.).

The exact location of the discovery was not given. Pemex said a pipe line is under construction to take the oil to El Rayo and from there by river transportation to Minatitlan where Pemex has a 26,000-bbl.-daily refinery.

Called Great Triumph

The Mexican announcement of the discovery said the successful completion of the well was a great triumph for Mexican engineering since numerous difficulties, including high pressures, were encountered. Three Pemex engineers, Alfonso Bometche, Manuel Rodriguez Aguilar, and Miguel Quiroz, were cited for their work in connection with the operation.

Pemex said the area had been previously explored without success. Some structures in Tabasco are among those to be drilled under the recent contract between Pemex and the American group consisting of Signal Oil Co., E. W. Pauley, and American Independent Oil Co.

Pemex said a second well, 2 Fortuna Nacional, would be undertaken within the next 20 days. Formation pressure in the discovery well was reported to be 3,300 psi., and because of this it was necessary to develop a special mud which would control the pressure and still possess the necessary fluidity for return circulation.

Imperial Makes New Cut In Redwater Production

Alberta production was brought under further limitation last week when Imperial Oil, Ltd., reduced by about 25 per cent the amount of oil it is taking from Redwater field northwest of Edmonton.

First cuts in Redwater production were made about 10 weeks ago. Output of wells in the field has been reduced to 125 bbl. daily.

Rapid development of the field with an increasing number of wells has saturated the available markets. Alberta production is now meeting needs of refineries in the area, and relaxing of the production restrictions awaits completion of a pipe-line outlet to Regina the summer of next year.

Sinclair Surrenders Panama Concession

SINCLAIR PANAMA OIL CORP. is giving up its concession in Panama after nearly 3 years of exploration, including two dry wildcats.

The company, which has had one rig running in the country, is crating its equipment for shipment to the United States. Sinclair Panama is owned by Venezuelan Petroleum Co. (Sinclair) and Cities Service Co.

The 20-year concession over more than 17,700,000 acres was obtained in 1946, and the initial 3-year period for exploration was to expire late this year. The Panamian Government granted a 3-year extension of this exploratory period, but a bill confirming this action failed to come out of committee before the National Assembly adjourned in April.

The principal reason for the company's withdrawal, however, was reported to be lack of success of the program to date. It notified the government that, as a result of the two nonproductive wells and the extensive geological work carried out, it did not wish to conduct further drilling operations.

The first test on Colon Island off Bocas del Toro was abandoned between 8,000 and 9,000 ft. The second test was drilled on the Pacific side of the country near Puerto Armuelles in the Province of Cherique. It was abandoned only recently at 9,715 ft. in the basement after encountering no shows.

The company paid $25,000 annually to the government during the exploration period. Under the contract, it was to select at the end of the 3 years any acreage it wished to keep for development.

Standard to Continue Expenditures in Brazil

Because of Brazil's rapidly increasing demand for petroleum products, Standard Oil Co. of Brazil is continuing a major program of capital expenditures in the country with an outlay of about $4,500,000 annually in the 6-year period 1946 through 1951.

This marketing affiliate of Standard Oil Co. (N.J.) is making substantial investments in such facilities as ocean terminals, warehousing, tank cars, and tank trucks as well as improvement of existing equipment. During his recent trip to Brazil, R. T. Haslam, a vice president and director of the parent company, said total investments during the 6 years would be 484,000,000 cruzeiros which is about $26,000,000 at the official rate.

A new ocean terminal was opened several months ago at Rio Grande do Sul in southern Brazil, and another is being built at Paranagua, also in southern Brazil. The company also has been expanding its facilities to handle L.P.G. which has been outstanding in the growth of petroleum demand in the country since the war.

Dual Price System Hits French Gasoline Buyers

The French National Assembly has voted into law an unusual government-sponsored double pricing system for gasoline.

The plan is designed to raise approximately 25,000,000,000 francs to meet a budget deficit. Its adoption had become a major French political issue, and threatened to become a test of the government.

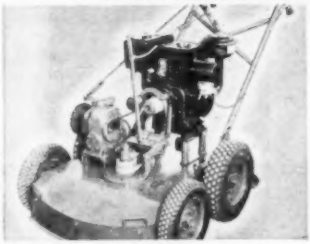
The price of gasoline for nonpriority users becomes 82 cents a gallon. Doctors and some other priority consumers will be allowed to buy gasoline at the old price of 54 cents a gallon, but others will be required to pay this price plus a 28-cent premium.

CUT FIRE HAZARDS!

Keep weeds, grass under control with the right

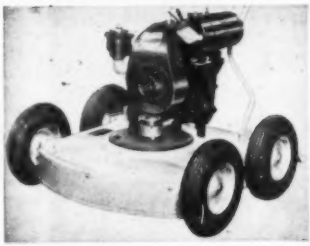
TORO-WHIRLWIND

POWER MOWER Trademark Reg. U.S. Pat. Off.



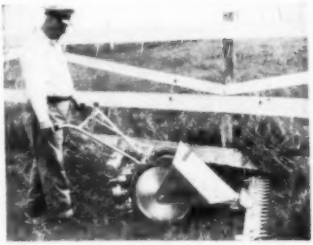
WHIRLWIND "SP"

. . . 24-inch self-propelled rotary-scythe mower grooms fine lawns . . . wades easily through tall weeds and tangled vegetation. 4 h.p. Briggs & Stratton engine. Welded, heavy plate steel construction. Equipped with 16 precision ball or roller bearing units.



WHIRLWIND "JUNIOR"

. . . 20-inch rotary-scythe mower . . . self and hand-propelled models. Patented suction action lifts growth for level cut, chops clippings to fine mulch. Removable blade sharpens in a jiffy. Easy to operate . . . dependable . . . economical.



TORO "ZIPPER"

. . . 36-inch power sickle for cutting around tank farms and oil fields. Replaces five men with hand scythes. Balanced for easy handling on rough ground, side slopes and close to obstacles. Simple to transport. Equipped with 1½ h.p. engine.

TORO "BULLET" TRACTOR

with 5-foot sickle bar for large scale cutting of weeds and high grass. Light, low, powerful turf-maintenance tractor with short turning radius. Fast-cutting bar provided with hydraulic or manual lift. Cuts at any angle from 90° up, to 45° down.

NATION-WIDE SERVICE

Toro and Whirlwind mowers are used by major oil companies all over the world. Unmatched nation-wide sales and service organization. Write for free catalogs and name of your nearest distributor. Toro Mfg. Corp., Dept. OG-69, Minneapolis 6, Minn.

NOR-BRO-LOY

SWAGED NIPPLES

A special high quality product, precision-machined from solid bars of alloy steel selected for its high tensile strength and elastic limit. This special alloy was selected only after exhaustive tests of various alloys.

These swaged nipples are made in sizes from ¼-inch to 1½-inch inclusive.

Norris Brothers, INC.
ROBINSON · ILLINOIS

Keep your pipes clean!

NORTHRUP

DISC-CUP MODEL — SIZE 8"

GO-DEVILS

Northrup Go-Devils are ruggedly constructed of highest quality materials. They clean thoroughly and last long.

There are Northrup Go-Devils for every size pipe and every pressure. Specify "Northrup".

Every order shipped the day received

WASHINGTON ENGINE & PUMP CO.
Box 372, Washington, Pa.

Big Increase in Oil Imports by Marshall Plan Countries Seen

WASHINGTON.—The Marshall plan countries will import approximately 25 per cent more crude oil and refined products in the year immediately following the termination of the European Recovery Program than during the current fiscal year, it is indicated by an interim report of the Organization for European Economic Cooperation released here last week by the Economic Cooperation Administration.

The OEEC figures consolidating the programs of all the participating countries, but not including their dependent overseas territories, are based on 1948-49 prices and, so far as oil is concerned, on development of their own refining industries.

The report shows that total imports of crude and products in the 1953 year will total $1.501,000,000 compared with $1,265,000,000 for the current year. This will be accomplished by increasing the importation of crude from the $327,000,000 estimated for this year to $869,000,000 and reducing imports of products from $938,000,000 to $632,000,000.

There will be only slight diminution in demand on the Western Hemisphere, but while the requirements for crude from that area will increase from $159,00,000 to $311,000,000 the call for products will drop from $521,-000,000 to $324,000,000, the OEEC reported.

Products Will Drop

On the other hand, imports of crude from participating countries and their dependent overseas territories will increase from $90,000,000 to $300,000,000 while imports of products will drop from $313,000,000 to $228,000,000.

The OEEC report showed that the Marshall plan countries plan to develop their crude oil throughput to 480 per cent of the 1935-38 level by the fiscal year 1953, which would be approximately 5 times the 1947 throughput.

The program provides for more than doubling the prewar consumption of petroleum products, the OEEC said, commenting that "this raises important questions, particularly whether it is wise to expand consumption of imported oil in order to save coal."

The report added that the participating countries propose to refine 80 per cent of their requirements of petroleum products, compared with 40 per cent before the war, which not only will provide an appreciable saving in foreign exchange but make possible the creation of new ancillary industries.

The Marshall plan countries reported that oil exploration is going on in France, Italy and Turkey wherever geological and geophysical studies indicate the possible existence of deposits, and this work has led to the discovery of important supplies of natural gas in France and oil deposits in Turkey, where three wells are reported to have an output of approximately 150 tons per day.

Natural gas, however, plays an unimportant part in the economy of the Marshall plan countries as a whole, and only France refers to this source of energy in her program, where, though, it represents no more than 0.6 per cent of the total potential of available energy.

Venezuelan Cabinet Shift Affects Oil

MANUEL R. EGANA, attorney and minister of fomento in Venezuela under former President Lopez Contreras, has again been appointed to the post in a cabinet reorganization.

Egana succeeds Pedro Aguerrevere, who became minister after the military junta took over the Venezuelan Government last November. However, it was reported that the ministry will be split and that Aguerrevere would head the new mines and petroleum organization with Egana continuing as minister of commerce.

Such a division of the ministry has been favored for some time, even under the old government. Unofficial reports were that this would be carried out in the next few weeks.

Egana, who for the time being at least heads the complete ministry, as an attorney has been representing various cattle raising interests.

His service as minister under President Contreras was prior to 1941. He is said to be familiar with operations of the petroleum industry.

Aguerrevere is well known among officials of the oil industry. He was educated at Leland Stanford University and at Colorado School of Mines.

Argentine Gas Line May Start Operating in Fall

Direccion General del Gas del Estado of Argentina is planning to have its 1,100-mile natural-gas pipe line from Comodoro Rivadavia to Buenos Aires in limited initial operation by late August.

Work on the one compressor station at the field end is under way, and much of the 10-in. pipe has been laid. The line is designed to deliver ultimately 35,000,000 cu. ft. daily. Direccion General del Gas is the agency which holds a virtual monopoly on gas distribution in Argentina.

Construction Started on Big Refinery in England

Anglo American Oil Co., Ltd., British affiliate of Standard Oil Co. (N.J.), has reported that construction is now under way on Europe's largest refinery at Fawley, England, which when completed approximately 3 years from now, will have an output of 110,000 bbl. daily.

David A. Shepard, chairman of Anglo American, said that the project "is an important contribution" to the program outlined in the British Government's economic survey for 1949 to increase the oil-refining capacity of the United Kingdom.

The new refinery will substantially reduce Britain's dollar expenditures for petroleum products, and thus will be of particular significance to the British economy, Anglo American reported. These savings will result from greatly increased shipments of crude oil for refining at Fawley, instead of importing more costly refined products.

The refinery is expected to cost approximately $150,000,000. It will manufacture gasoline, kerosine, gas, and diesel oil, heavy residual fuel oils, asphalt, and certain special products.

Site of the new refinery covers some 970 acres and ultimately 2,500 people will be employed. The existing refinery at Fawley has a daily capacity of 18,000 bbl., and employes 900 persons.

Colon's Output Declines

Production of Colon Development Co., Ltd., from its three fields southwest of Lake Maracaibo, Venezuela, totaled 4,157,579 bbl. last year, according to the company's annual report. The daily average of about 11,-380 bbl. compares with approximately 12,750 bbl. daily the previous year, and the company pointed out the new production from Los Cerritos (West Tarra) during the year was insufficient to offset the natural decline in El Cubo-Las Cruces and Los Manueles. The company, a member of the Royal Dutch-Shell group, noted in August it began the Rio Catatumbo deep test. This well was still drilling at last report.

Hallanan Says Industry Must Keep Promise to Cut Imports

HOUSTON.—The oil industry must keep faith with its announced policy on imports of using oil only to supplement domestic production, Walter S. Hallanan, chairman of the National Petroleum Council, said here last week.

Hallanan, who is also president of Plymouth Oil Co., headed a group of oil officials and bankers on tour of the company's Texas oil properties. He said that imports have gone far beyond the point of supplementing domestic production in the last few months. These excessive imports have curtailed drilling and exploratory activity, seriously reduced the revenue of many states, and forced small independent refiners and producers out of business, he declared.

Referring to the statement on imports in the national oil policy by the NPC, Hallanan said:

"This declaration of principles was looked upon as a statesmanlike and historical document. It devolves upon every group within the industry to see that policies therein set forth are carried out in good faith. Failure to keep that faith would not only cause irreparable damage to a vital industry and to the national safety, but it would invite forfeiture of the high degree of public confidence and good will which the industry has earned through outstanding performance in the public interest.

"For the last several months imports have gone far beyond the bounds of supplementing domestic supply. In reality they have supplanted production from our own fields and forced serious and crippling cutbacks in output. Small independent producers and refiners are being forced to the wall, drilling and exploratory activities are being curtailed, and the revenues of many states and political subdivisions are seriously impaired.

"By no yardstick of economics can there be justification for an import program in excess of the amount necessary to supplement domestic production. By Herculean effort, and at great hazard and capital outlay, the industry has brought domestic supply into balance with all demands. It should not be penalized for this noteworthy achievement in the public interest.

"It would be foolhardy and perilous to minimize the gravity of the situation that has been brought about in the oil industry, and in those states and communities largely dependent upon it, as the result of the abnormal and excessive imports. The time has come to face this situation realistically. It cannot be viewed in any other light than as a serious menace to the domestic industry and a consequent jeopardizing of the national security."

Oil officials accompanying Hallanan on the inspection trip included: W. E. Huston, president of Republic Oil Refining Co.; Paul G. Benedum, president of Hiawatha Oil & Gas Co.; W. M. Griffith, vice president of Plymouth Oil Co.; A. R. Budd, director of Plymouth; Charles R. Herpish, secretary and assistant treasurer of Plymouth; Sam T. Mallison, director of Republic Oil Refining Co.; J. M. Gardiner, vice president of Republic; C. William Campbell, director of Republic; E. B. Kelley, director of Republic Pipe Line Co.; C. A. Floto, executive vice president of Benedum-Trees Oil Co.; and J. R. Wylie, Jr., vice president of Hiawatha Oil & Gas Co.

DAY after DAY
MORE OPERATORS ARE
DISCOVERING THE EFFICIENCY
OF
JP RODS AND LINERS
MACHINED Right
and HARDENED HARD
Because JP Rods and Liners are made from top-quality materials, machined right and hardened hard . . . drillers are able to make more hole with fewer work stoppages. JP Rods and Liners are really standing the test and from the men in the field we get truly outstanding reports of their superior performance and satisfaction. You, too, can profit with JP—give us a try, won't you?
Expert oil country machinists, using top-quality materials, grind and finish JP Rods and Liners to precision standards. In addition—each and every JP Rod and Liner is "hardened" by a patented process and individually inspected to approximately 600 (or better) Brinell test.
CALL — WRITE — WIRE — CABLE
Made to A.P.I. Standards, JP Rods and Liners are available in all stock sizes (and special sizes) to fit any slush pump. For information on sizes and prices—give us your specifications.
JP
J P Machine & Tool Company
1534 S. E. 29th
P. O. BOX 4698
TEL. 6-8700
OKLAHOMA CITY

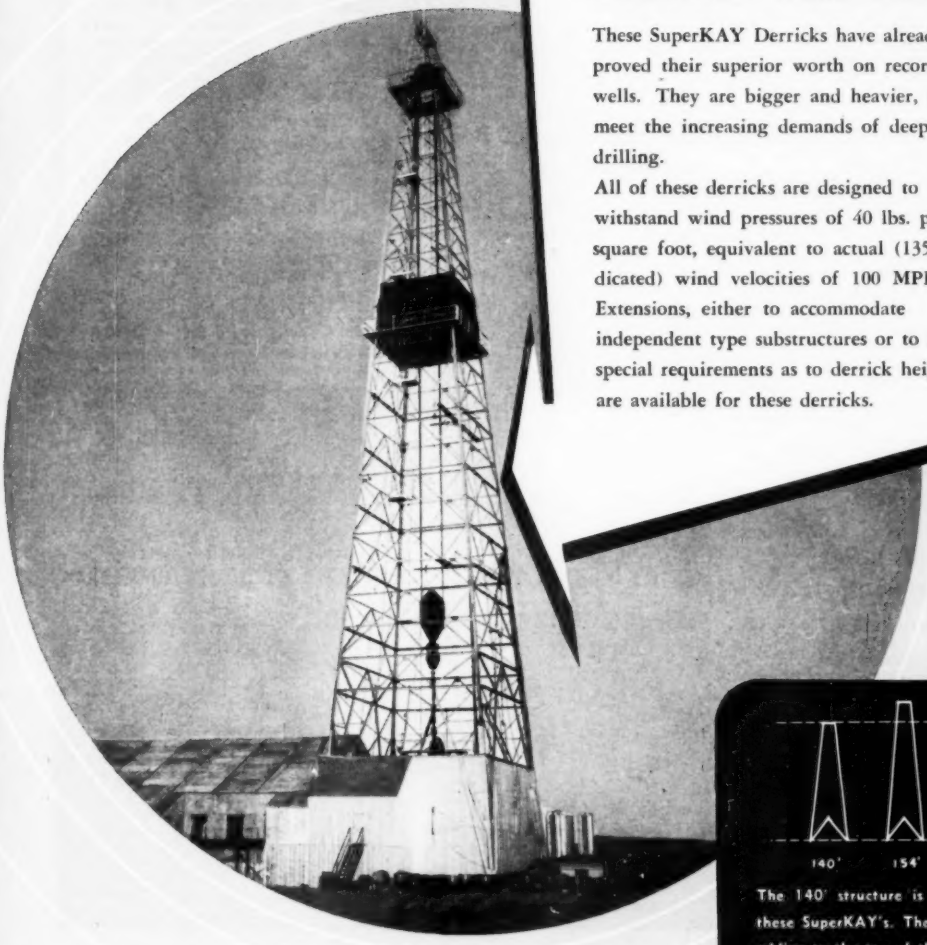
LEE C.

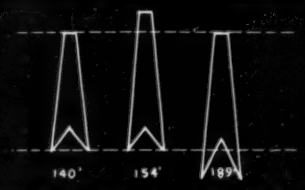
Moore SuperKAY DERRICKS

MEET THE DEMAND FOR DEEPEST WELL DRILLING

These SuperKAY Derricks have already proved their superior worth on record-depth wells. They are bigger and heavier, to meet the increasing demands of deeper drilling.

All of these derricks are designed to withstand wind pressures of 40 lbs. per square foot, equivalent to actual (135 Indicated) wind velocities of 100 MPH. Extensions, either to accommodate independent type substructures or to meet special requirements as to derrick heights, are available for these derricks.





The 140' structure is the basic size of these SuperKAY's. The 154' is made by adding to the top of the 140', while the 189' is made by adding to the base of the 140' structure.

LEE C. MOORE CORPORATION

TULSA • DALLAS • HOUSTON • MIDLAND • SHREVEPORT • WICHITA • CENTRALIA • PITTSBURGH

Export Office — 50 Church Street, New York 7, N. Y.

Petroleum Equipment Suppliers Elect Guy Tompson President

COLORADO SPRINGS.—The Petroleum Equipment Suppliers Association, holding its fourteenth annual meeting here June 5-7, elected Guy A. Tompson of Bethlehem Supply Co., president, succeeding A. W. McKinney of National Supply Co.

Ted Sutter of Baker Oil Tool Co. was elected vice president. H. R. Safford, Jr., was reelected executive secretary of the association, and Wharton Weems of the Houston legal firm of Vinson, Elkins, Weems & Francis, was reelected treasurer and general counsel.

A standing tribute was paid by the association's membership to W. M. (Merve) Bovaird, who was vice president at the time of his recent death. Newly elected board of directors for the coming year include:

Eastern district: George H. Alten, Alten's Foundry & Machine Works, Inc.; Karl Elliott, Acme Fishing Tool Co.; Jene Harper, Franklin Supply Co.; O. M. Havekotte, International Derrick & Equipment Co.; Mason Jones, S. M. Jones Co.; A. S. Knowles, Parkersburg Rig & Reel Co.; Donald W. Mackie, Bradford Supply Co.; Frederick F. Murray, Oil Well Supply Co.; A. W. McKinney, National Supply Co.; Ferd J. Spang, Spang & Co.; H. Bernard Wehrle, McJunkin Supply Co.; M. L. Lamphere, Ajax Iron Works.

Mid-Continent and Rocky Mountain district: Frank E. Bernsen, Lucey Products Corp.; E. C. Bolger, W. C. Norris, Manufacturer; Davis D. Bovaird, Bovaird Supply Co.; R. A. Campbell, Hinderliter Tool Co.; W. H. Larkin, Larkin Packer Co.; Walter O'Bannon, Walter O'Bannon Co.; J. L. Shakeley, Jones & Laughlin Supply Co.; Guy A. Tompson, Bethlehem Supply Co.; Jay P. Walker, National Tank Co.; S. P. Wallace, Maloney Crawford Tank & Mfg. Co.; Carl White, Jr., Franks Mfg. Corp.; J. Iverson, Iverson Supply Co.

Southwestern district: W. T. Campbell, Mission Mfg. Co.; Harry B. Catlow, Republic Supply Co.; Ken W. Davis, Mid-Continent Supply Co.; J. E. Everroad, Cummins Sales & Service Co.; R. G. Hamaker, Reed Roller Bit Co.; Frank Hereford, Murray Brooks, Inc.; E. L. Lorehn, Cameron Iron Works; Fred M. Mayer, Continental Supply Co.; Ralph Nouhaus, Hughes Tool Co.; George O'Leary, Houston Oil Field Material Co., Inc.; Howard W. Pape, Jarecki Mfg. Co.; Wallace D. Wilson, Wilson Supply Co.

Pacific district: J. C. Axelson, Axelson Mfg. Co.; Markley C. Brown, Hillman Kelley, Inc.; J. A. Crawford, Youngstown Steel Products Co.; E. S. Dulin, Byron Jackson Co.; Rodney S. Durkee, Lane Wells Co.; D. S. Faulkner, National Supply Co. of California; H. H. Glen, Emsco Derrick & Equipment Co.; H. E. Howard, Howard Supply Co.; Wendell Jones, Bethlehem Supply Co. of California; Warner Parker, Oil Well Supply Co.; John P. Pike, Republic Supply Co. of California; Ted Sutter, Baker Oil Tools.

Louisiana Mineral Board Sets Lease Sale July 28

BATON ROUGE.—The State Mineral Board has announced a lease sale to be held Thursday, July 28, with Monday, June 13, the last day applications for leasing will be accepted for the sale.

A board meeting will be held June 30, and July 18 will be the last day docket material will be accepted for consideration.

At the board meeting, agreements, assignments, and approval of agency leases will be discussed.

C. J. Bonnecarrere, secretary, announced that the board will hold regularly scheduled meetings on the last Thursday of each month, excepting holidays. When the meeting date falls on holidays it will be held the preceding Wednesday.

Arkansas Allowable Cut by 10,000 Bbl. of Oil Daily

The Arkansas Oil and Gas Commission, issuing an emergency order on June 6, reduced the daily crude-oil allowable in all controlled pools by 15 per cent, or approximately 10,000 bbl per day.

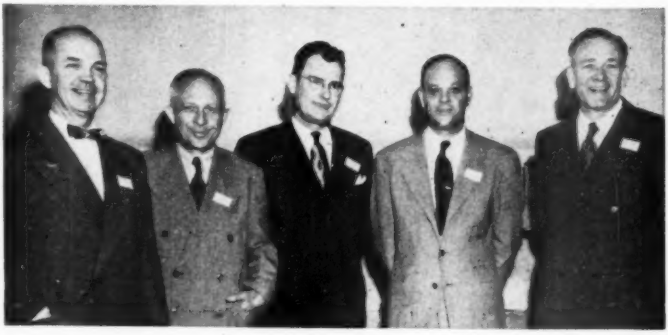
Lester F. Danforth, director of the commission, said that a call has been issued for a special hearing in El Dorado, Ark., Tuesday, June 14 at 10 a.m. to determine whether the emergency order reducing the state's allowable should remain in effect until the next regular hearing of the commission. It is during regular hearings that all pool allowables are set by the commission.

Esso Standard Makes Cut In Crude-Oil Purchases

Effective June 4 Esso Standard Oil Co. announced a 15 per cent reduction in its crude-oil purchases in Louisiana, Arkansas, and Mississippi. The purchases go principally to the company's refinery at Baton Rouge, La., which has a daily crude-oil capacity in excess of 200,000 bbl.

The company announced that so far as possible stripper fields where it purchases would not be included in this 15 per cent reduction in purchases. Officials also explained that curtailment would not apply to unusual situations in which curtailment would result in waste.

ROCKY MOUNTAIN A.P.I. OFFICERS AT CASPER MEETING

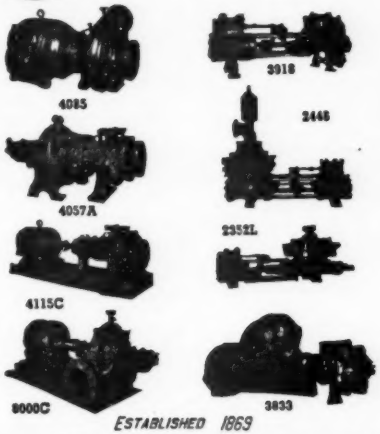


Officers of Rocky Mountain division, American Petroleum Institute, at the recent meeting of the institute in Casper, Wyo. Left to right: D. T. Hoenshell, General Petroleum Corp., Casper, secretary-treasurer; J. C. Johnston, Continental Oil Co., Denver, chairman of advisory committee; Charles A. Pickett, The California Co., Denver, vice chairman, Colorado; Zack M. Brinkerhoff, Jr., Brinkerhoff Drilling Co., Casper, president; and W. M. Saxon, Pure Oil Co., Billings, Mont., vice chairman for Montana. Other officers not pictured include C. L. Larson, Jr., Stanolind Oil & Gas Co., Casper, vice chairman, Wyoming, and Claude E. Peavey, Phillips Petroleum Co., Salt Lake City, vice chairman for Utah

PUMPS

CENTRIFUGAL
RECIPROCATING

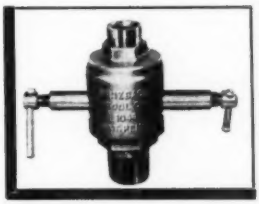
BUILDERS OF OUTSTANDING PUMPS
Since 1869



ESTABLISHED 1869

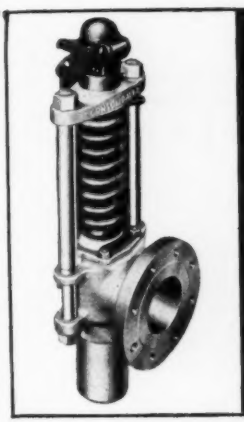
DEAN BROTHERS PUMPS INC.
INDIANAPOLIS IND.
323 W TENTH ST.

Stop Worrying About Leaky Stuffing Boxes



Install Kinzbach Polished Rod Stuffing Boxes on your pumpers and your stuffing box worries are ended. Plastic packed, with a floating, self-aligning gland, they hold positive seals under toughest conditions. Unique design permits plastic to be added as required or seal to be tightened at any time without shutting down the well. Available for all popular sizes of polished rods.

KINZBACH TOOL CO., INC.
P. O. Box 277 Houston, Texas
Export Office: 74 Trinity Place, New York, N. Y.



New! CONSOLIDATED Maxiflow SAFETY VALVE

It solves the problem!

The CONSOLIDATED Maxiflow was designed and engineered to meet operating requirements of high pressure, high temperature steam generating equipment. A new addition to the CONSOLIDATED Safety Valve line, the Maxiflow answers the need for a valve with greater discharge capacity, shorter blowdown and other special characteristics not found in conventional safety valves.

Blowdown, adjustable to a low of 1%, is achieved by advantages no other safety valve possesses.

The CONSOLIDATED Thermodisc seat design —incorporated in the Maxiflow—guarantees a degree of tightness not found in any other safety valve.

Function, design, materials, weight, safety and space—all have been major considerations of creative engineering and unsurpassed workmanship in the development of the CONSOLIDATED Maxiflow Safety Valve.

We will be glad to send you a detailed bulletin concerning the Maxiflow.

MANNING MAXWELL & MOORE MM&M TRADE MARK

CONSOLIDATED SAFETY VALVES

1879 CONSOLIDATED U.S.A.

A Product of
MANNING, MAXWELL & MOORE, INC.
BRIDGEPORT 2, CONNECTICUT

Makers of Consolidated Safety and Relief Valves, 'American' Industrial Instruments, Hancock Valves, Ashcroft Gauges. Builders of 'Shaw-Box' Cranes, 'Budgit' and 'Load Lifter' Hoists, and other lifting specialties.

WASHINGTON WATCHING

BY BERTRAM F. LINZ

The Dope on T-H

WASHINGTON.—The Senate this week began consideration of new labor legislation and is now engaged in what promises to be a knock-down and drag-out fight.

The first big contest will be over the right of the Government to seize plants in peacetime in the event of national strikes, but other fights are in sight over at least three vital and any number of less-important provisions.

Strangely enough, it was not President Truman's influence but that of C.I.O. President Phillip Murray which led the Senate to take up revision of the Taft-Hartley Act. Well aware he has no chance of getting the kind of labor law he wants this year, Truman was willing to let it lie over to become an issue in the 1950 congressional campaign, but Murray felt otherwise.

Administration Democrats got together last week-end in an effort to decide on a program of what should go into the bill but wound up with an admission that they would have to take what they could get. The 13 southern Democrats will work for retention of as much of the Taft-Hartley Act as possible, but the Republicans are split, with Sen. Irving M. Ives of New York, leader of a group of about a dozen, refusing to agree to support compromise legislation which he and Sen. Robert A. Taft of Ohio had previously worked out.

Nevertheless, the present outlook for the administration's plan to scrap the Taft-Hartley Act in favor of an "improved" Wagner Act is about as follows:

The Senate will pass a bill which is merely a modification of the present law and send it to the House for concurrence. The House labor committee, committed to total repeal of the Taft-Hartley Act, will not be able to accept the Senate measure and will come in with a much watered-down version which the House will promptly reject, as it did before, and restore most of the Senate provisions.

There will, however, be differences between the Senate and House actions which will necessitate sending the bill to conference, and the conference committee, strongly loaded with administration supporters, will make another effort to emasculate the legislation. House and Senate will resist such efforts, however, and after sending the bill back to the conferees, maybe two or three times, finally will get what they want.

Eventually, Congress will send to the White House a bill which will bear more than passing resemblance to the present law and no resemblance whatever to what the President wants. Truman has been adamant in his demand for total repeal of the Taft-Hartley Act, and if he is consistent will veto the bill. Congress probably would not be able to make it law over that veto, and the session will end with the present statute still on the books.

That is probably about what Murray expects, and maybe wants, and will make Taft-Hartley repeal the undisputed major issue of the 1950 campaign in which labor will go all-out to elect members of Congress favorable to its cause.

Navy vs. Air vs. Oil

THE recent fight between the Air Force and the Navy over the construction of the supercarrier "United States," in which the Air Force won and Secretary of the Navy John L. Sullivan resigned, may have overlooked something of more than slight importance—the relative cost in fuel of launching planes from a carrier close to a target and of sending them off from far more distant land bases.

Supporters of a big navy have raised the question of fuel cost, asserting that global strategic bombing involves tremendous demands on fuel supplies that the Air Force has underestimated.

This argument is premised on the fact that a carrier can transport a hundred planes or more to a point fairly close to a target, using more readily available and lower-cost heavy fuel, whereas planes taking off from land bases at greater distances require high-octane gasoline or jet fuels.

Another point made by those interested in the Navy is that a carrier force can select a launching point which can send planes toward a target over a course which may not be anticipated by an enemy, whereas land-based planes have considerably less flexibility of route between base and target.

In a broad sense, the big-navy interests see in the scrapping of the plans for the supercarrier a step toward further inroads on the strength of the Navy under a plan which would put all the eggs of security in the single basket of air power. But they point out that the earth's surface is 70 per cent water, no modern war can be waged without some dependence upon water-borne commerce, and the Russians have a submarine fleet known to be larger than the Germans had at the beginning of World War II.

Pipe-Line Probe

AN exhaustive investigation of the nation's transportation facilities, including pipe lines, will shortly be started by the Senate interstate commerce committee to determine whether they are adequate both to meet the needs of an expanding economy and in terms of national defense.

A staff has been assembled by a subcommittee which will make the investigation and is now compiling basic data, and there is a possibility that public hearings may be held before the end of the session although there is no likelihood that the subcommittee can complete its survey before next year.

The investigation probably will parallel similar studies which have been made by the House interstate commerce committee, which has all of the basic information and whose reports could readily be brought up to date, but it isn't protocol, or something, for one committee to take up where another has left off, and so the Senate group will start from scratch.

The inquiry will be broken down into eight "comprehensive studies," No. 6 of which will relate to pipe lines, and one of the questions there to be studied is the effect of large expenditures upon transportation charges to the public and the extent to which transportation rates are reflected in the cost of goods to the consumer.

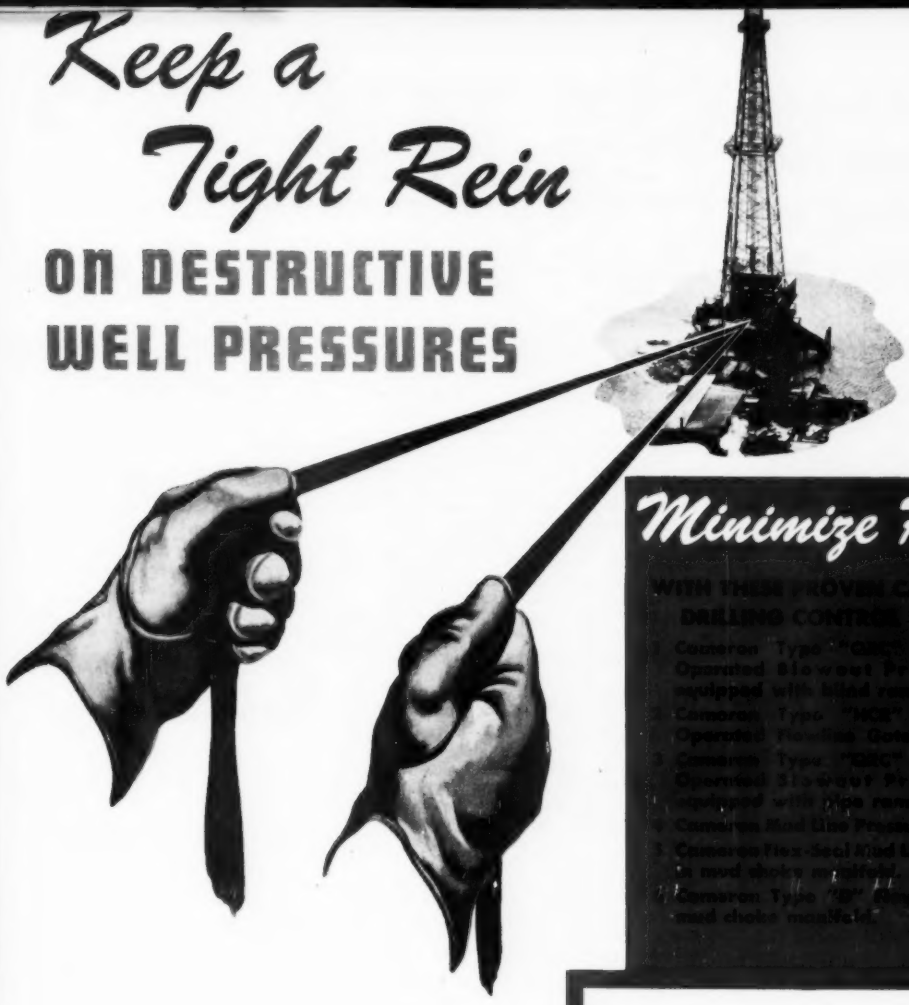
"People's" Cartel

WASHINGTON is full of organizations equipped with axes and stones on which to grind them, but only one is honest enough to call itself a lobby—the People's Lobby, although who the "people" are has never been made too clear.

Anyway, Benjamin C. Marsh, secretary of the organization, who works harder for less money than any other lobbyist in the Capital, is still plugging away, on behalf of the "people," on a proposal which raised cain back in August 1946 when a couple of

Keep a Tight Rein

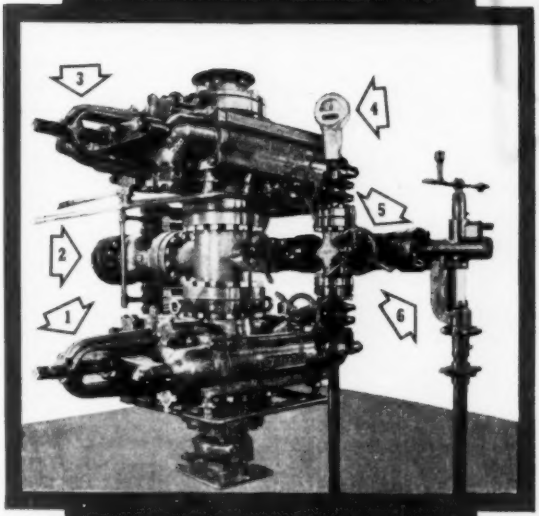
ON DESTRUCTIVE WELL PRESSURES



Minimize Risk

WITH THESE PROVEN CAMERON DRILLING CONTROL UNITS

1. Cameron Type "QRC" Pressure-Operated Blowout Preventer, equipped with blind rams.
2. Cameron Type "HCR" Pressure-Operated Flowline Gate Valve.
3. Cameron Type "QRC" Pressure-Operated Blowout Preventer, equipped with pipe rams.
4. Cameron Mud Line Pressure Gauge.
5. Cameron Flex-Seal Mud Line Valves in mud choke manifold.
6. Cameron Type "F" Flow Wing in mud choke manifold.



Most operators agree that Cameron Type "QRC" Pressure--Operated Blowout Preventers and Type "HCR" Pressure Operated Flowline Gate Valves provide maximum protection against destructive well pressures. They may be relied upon to close swiftly and seal positively while drilling, or with pipe out of the hole, or to close the flowline.

To complete this drilling control assembly . . . to add the final measure of safety . . . many operators in high pressure areas have standardized on the Cameron hookup illustrated at right, which includes a mud choke manifold assembled from Cameron Flex-Seal Valves, Cameron Flow-Wing with positive choke for bleeding-off pressures, and a Cameron Mud Line Pressure Gauge.

Complete details on all of these Cameron units will gladly be sent on request.

Cameron

IRON WORKS, INC.

P. O. BOX 1212 **HOUSTON, TEXAS**

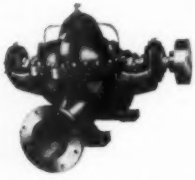
Export: 74 Trinity Place, New York, N. Y. Oklahoma: 310 Thompson Bldg., Tulsa (Telephone 28970). California: Long Beach (P. O. Box 267). Wyoming: 356 N. Wolcott St., Casper. North Louisiana: Bossier City (P. O. Box 425). Texas: Midland (Telephone 1982), Corpus Christi (Telephone 28783), Fort Worth (Telephone 46522).

General Purpose Centrifugal Pump Engineering and Application Data

NEW PEERLESS PUMP BULLETIN

Describes and Illustrates
Pumps from 1¼" to 48"
with capacities to 60,000 gpm,
heads up to 300 ft.;
handling fluids to 300 F.

Here is a helpful, up-to-date, information on the augmented line of Peerless Type A single stage, double suction, split case, horizontal pumps for handling water and other alkaline liquids. This new 24-page bulletin is fully illustrated, showing construction details and sectional views, as well as giving complete dimensional data on each pump size in the line.



fmc PEERLESS PUMPS

Request Your Copy Today!
Ask for Peerless Pump
Bulletin B-1300

PEERLESS PUMP DIVISION
FOOD MACHINERY AND CHEMICAL CORPORATION
Factories: Indianapolis, Ind.; Los Angeles 31, Calif.
District Offices: Chicago 40, 4554 N. Broadway; New York 5, 37 Wall Street; Omaha, Nebr., 4330 Leavenworth St.; Atlanta Office: Rutland Bldg., Decatur, Ga.; Dallas 1, Tex.; Fresno, Calif.; Los Angeles 31, Calif.

State Department men trotted it out.

Briefly, Marsh says the way to insure world peace and prosperity for Europe includes a United Nations oil cartel—international control of production and distribution and international allocation of markets.

The idea was first advanced by John Loftus, former chief of the State Department petroleum division, in a broadcast with Charles B. Rayner, then adviser to the department on petroleum policy, and Col. G. H. Vogel, then executive officer of the Army-Navy Petroleum Board and now head of the National Security Resources Board petroleum division. The broadcast created such a storm of protest that the idea was dropped cold by everybody but Marsh.

The original suggestion was for a U.N. organization which would do what the Anglo-American petroleum agreement was hoped to do—set up an international arrangement under which all producing nations would be insured a fair deal for their oil and all the consuming nations would be guaranteed free access to oil supplies.

Angle on Imports

MILITARY as well as independent producer circles are concerned over the import situation.

From the military angle, the possibility that continued heavy imports will slow down the search for new domestic reserves and retard the development of recently discovered fields is a matter of considerable importance.

Defense officials aren't talking about the situation for publication, although they have discussed it extensively with oil men, but they are not too happy over the chances of defending the Middle East in the event of a war with Russia nor of having to depend upon emergency development of domestic resources to provide the oil necessary for war.

As time goes on, military experts are more strongly of the industry's opinion that the only useful reserve is a developed reserve, remembering the experience during the last war with the development of Elk Hills, which did not reach its peak output until after its oil was no longer needed.

Meanwhile, independent producers charge that the companies are not living up to their promises to reduce their imports. According to Russell B. Brown, general counsel of the Independent Petroleum Association of America, the records indicate that only Standard Oil Co. (N.J.) has made a real effort to curtail its use of foreign oil.

Since the middle of April, Brown said, crude imports have been steadily increasing, reaching an average of 434,000 bbl. daily during the week ended May 21 from 336,000 bbl. daily during the week ended April 23.

Call on Boyd

QUICKER DELIVERIES
PIPELINE SUPPLIES

CARDWELL AUTOMATIC
RELEASE PIPE TONGS

CLARENCE L.
BOYD
CO.
TULSA, OKLAHOMA

GET ON THE *BALL!*
WITH
REED BALL TYPE
PIPE LINE DOLLIES

Permits both rotation and endwise movement of pipe on the same dolly.

STURDILY BUILT ● ECONOMICALLY PRICED

Available in both Standard and Special Models to handle pipe of any length or diameter.

DESIGNED AND BUILT BY

REED ENGINEERING CO.
CARTHAGE, MISSOURI, U. S. A.

EQUIPMENT MEN ... in the News

Porter-Dowell Chemical Firm Recently Formed

W. B. PORTER

Formation of Porter-Dowell Chemical Co. at Mount Vernon, Ill., has been announced. This newly formed organization is headed by W. B. (Bill) Porter, who has been active in the oil industry since 1934, having served with Bridgeport Machine Co., Larkin Packer Co., and since the war with Kem-I-Kal Laboratories as sales manager. Porter resigned his position to organize his own company.

The new company will manufacture paraffin solvents to cut paraffin in tubing and flow lines, under the trade name, Sol-Treet; Gypstone water treat and solvent to prevent formation of calcium carbonate and to remove it from oil well flow lines, and to prevent formation of what is commonly called "gyp" on rods and tubing and balls and seats in pumping wells; and a tool joint treating compound under the trade name, Tol-O-Grip.

Porter's associate in the chemical business is N. Yates Dowell, former executive vice president and general manager of Lombard Iron Works Co., Augusta, Ga., and more recently a practicing attorney at Mount Vernon, Ill.

Dallas Manufacturing Made Distributor for Gro-Cord

Dallas Manufacturing & Sales Co. has been appointed the sole distributor for Gro-Cord pipe-repair gaskets. C. E. Sherman, president of Dallas Manufacturing, has stated that Gro-Cord is in use by oil and pipe-line companies for making temporary repairs.

The gasket, formerly marketed by Gro-Cord Rubber Co., comes in roll form in many widths. It may be used over leaks in conjunction with a welded plate repair or with a chain jack.

Rubber Sleeve Appoints Carson as Sales Manager

Rubber Sleeve Specialty Co., Oklahoma City, manufacturers of Russco nonslip drill-pipe protectors and stabilizers, announces the promotion to sales manager of Lou H. Carson.

Mobile telephones have recently been installed in Rubber Sleeve Specialty cars in order to provide better service to their customers in Mid-Continent oil fields.

Mud Products, Inc., to Distribute OB Guns

Oil Base, Inc., manufacturer of OB mud guns, has appointed Mud Products, Inc., of Tulsa as its sole representative for mud guns in the Mid-Continent area. E. R. "Dick" Albert, Jr,. of Mud Products, Inc., will be in charge of sales and service.

With offices in all principal oil fields in the Mid-Continent and Gulf Coast and, in the near future, in the Rocky Mountain territory, Mud Products, Inc., can make immediate delivery on all types of mud equipment. West Coast distribution and export for OB mud guns will continue to be handled through Oil Base, Inc., Compton, Calif.

Fluor Appoints McKay as Advertising Manager

JACK McKAY

Fluor Corp., Ltd., designers, engineers, and constructors for the petroleum, chemical, and power industries, announces the appointment of Jack E. McKay as manager of advertising and public relations. McKay assumed this new position following 3 years as assistant to J. P. Wiseman, vice president and director of sales for Fluor.

Prior to joining Fluor in 1942, McKay was associated with Carter Oil Co. in Tulsa and Sinclair Refining Co. in Sand Springs, Okla.

Officers and Committeemen, Dallas Nomads

Officers and committeemen to serve the Dallas chapter of Nomads for 1949 are: (front row) C. A. McClelland, charter member; J. C. Baseheart, president, Brad Mills, regent; C. J. Berlin, secretary; J. A. Mussler, membership; (back row) E. J. Whetzle, treasurer; Vic LeMay, entertainment; A. J. Olson, sergeant-at-arms; E. J. Shiels, assistant secretary; and J. E. Everroad, membership. Other officers, not in the picture, are: R. J. Bauer, vice president; Earl Smith, assistant sergeant-at-arms; and F. I. Brinegar, regent

Johnston of Texas Expands Service to Permian Basin

M. O. Johnston, president of Johnston Oil Field Service Corp., Houston, has announced that the company, under the management of W. B. Taylor, vice president, has acquired assets and the service facilities located in Andrews, Kermit, Midland, Odessa, San Angelo, and Snyder, in West Texas, and Hobbs, N. M., from M. O. Johnston Oil Field Service Corp., a California corporation, of which Johnston is also president.

Both companies heretofore have been servicing oil-field testing tools, gun perforators, pressure recorders, packers, adjustable flow beans, and other oil-field tools in West Texas,

and this expansion by the Johnston Oil Field Service Corp. is to eliminate the overlapping of the services of both companies in the Permian basin in order that the oil industry may be better served.

Chenoweth Appointed to Republic's Houston Office

Republic Supply Co. announces the appointment of Robert "Bob" Chenoweth as manager of machinery sales, with headquarters in Houston.

Chenoweth has been engaged in the sales of machinery to the oil industry since 1929, at which time he started selling pumps in the Mid-Continent territory following graduation in mechanical engineering from Purdue. Since 1938 he has been located in Houston, and has represented several of the large machinery accounts in the Gulf Coast and Mexico areas.

Jones, Le Rouax Promoted By Oil Center Tool Co.

Marvin R. Jones has been named chief engineer and R. K. Le Rouax was appointed assistant chief engineer in promotions announced by John E. Eckel, vice president in charge of engineering at Oil Center Tool Co., Houston. Jones has been a member of the Oil Center Tool engineering department since 1946 and during that time he has helped develop and refine many of the present O-C-T products.

Jones attended Oklahoma University and is a registered professional engineer. Le Rouax is a graduate of Texas A. & M. college and joined Oil Center Tool Co., after his discharge from the Army in 1946.

Diesel Repair Shop Opened By Cummins at Odessa

A new, modern diesel repair shop, located at Odessa, Tex., has been added to the service maintained by Cummins Sales & Service, Inc. This newest Cummins Sales & Service branch is equipped with the latest equipment and offers service day and night.

A new fleet of service trucks has been installed to insure fast and efficient service. J. T. Calnon is service manager for the district and L. T. Troutz is foreman of the new shop.

Bettis Corp. Appointed Distributor for Texsteam

LOUIS MUSGROVE

Frank O. Richards, vice president and sales manager of Bettis Corp. of Houston, announces the appointment of Bettis as exclusive distributor for Texsteam safety valves, relief valves, and chemical injectors, manufactured by Texsteam Corp. of Houston.

Louis Musgrove, formerly sales manager for Texsteam, joins Bettis Corp. under this move. He will serve Bettis as manager of the chemical injector division and will specialize in handling Texsteam products.

Connette Made Assistant To A.C.F. President

R. P. Connette has been appointed assistant to the president of American Car & Foundry Co., with headquarters in New York. A graduate of Harvard, Connette also received the degree of L.L.B. from University of Virginia Law School in 1941.

He joined the public relations department staff of A.C.F. in October 1945. In 1947 he was transferred to A.C.F.'s executive department, in charge of the suggestion system and training program.

Schmidt Goes to Tulsa To Manage Reed Office

H. C. SCHMIDT

R. C. Schmidt has recently been transferred from Reed Roller Bit Co.'s West Texas division at Midland to Tulsa to head its Tulsa sales office Schmidt replaces C. A. Nabors, who resigned from the company for employment with the Parker Drilling Co.

Schmidt has a wide acquaintanceship in the oil business, having worked in the field for several drilling contractors. Prior to his employment by Reed he served as a field engineer for Technical Oil Tool Corp., Ltd., of Los Angeles.

Howard W. Jordan Made National Supply Director

The board of directors of National Supply Co. have elected Howard W. Jordan a director of the company to fill a vacancy on the board created by the resignation of J. H. Hillman, Jr.

Jordan is chairman of the board of Metropolitan Sand & Gravel Corp., Port Washington, N. Y. He was formerly president of Pennsylvania Rubber Co. and chairman of Federal Reserve Bank of Cleveland, Pittsburgh branch.

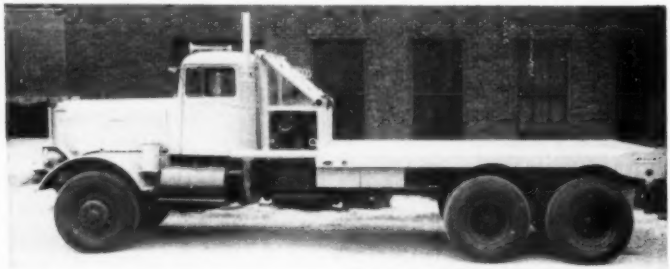
Mud Control Announces Personnel Changes

Russell J. Carison, president, Mud Control Laboratories, Inc., Oklahoma City, has announced the following changes in personnel: J. G. Vaughn, formerly with Baroid Sales Division in Michigan, has been placed in charge of the Oklahoma City laboratory and is available for field relief service. Bruce Pettigrove and Robert Baker, Oklahoma University students in petroleum engineering and geology, are taking a training program at the Oklahoma City office prior to their graduation.

Donald J. Keen has been named distribution manager in charge of warehouses. Foy Smith, service engineer, has been transferred to Ardmore, Okla., to assist Lynn D. Crider. Joe Rodolph, service engineer, has been transferred from Seminole to Duncan, Okla. R. W. Blakey, service engineer, has been transferred from Marlow to Guthrie, Okla.

Increased activities in the Elk City area in Oklahoma have necessitated

Leland Ships Largest Truck Body to Colombia



Leland Equipment Co., Tulsa, manufacturer of oil-field truck and trailer bodies, has completed fabrication of one of the largest oil-field bodies manufactured in this country. The body, mounted on a Kenworth No. 552 truck, is the heavy-duty tandem type, 112 in. width and 15 ft. in length back of the winch. The unit was manufactured for Richmond Petroleum Co. for heavy-duty hauling on the rugged elementary roads of South America

the transfers of Victor W. Davis from Pauls Valley, Okla., and Charles N. Hefner from Oklahoma City to Elk City to assist T. W. "Spec" Cooper in service engineering.

In the Rocky Mountain region, Kenneth Jones, service engineer, has moved from Vernal, Utah, to Cortez, Colo., to service drilling activities in the Green River, Cortez, and Farmington, N. M., areas. Harold F. Lloyd has been named warehouse distributor at Cortez. S. J. Putman has been employed as service engineer at Vernal.

Western Geophysical Co. Moves to New Quarters

Western Geophysical Co. and its affiliate, Western Geophysical Co. International, have moved from quarters in the Edison Building, Los Angeles, to new and larger accommodations in the Pacific Mutual Building, Los Angeles.

The company's accounting department, previously located in the Edwards & Wildey Building, will also be transferred to the new offices, but the addresses of shops and laboratories in the city will remain unchanged.

Fields Made Sales Manager For Northrup Equipment Co

Herman W. Fields has been named sales manager of Northrup Equipment Co. in the East Texas, Louisiana, Arkansas, and Mississippi region. Fields will make his headquarters in Shreveport, but will have direct supervision of the company's branch office and warehouse in Kilgore, Tex. He was formerly sales representative for Bradford Motor Works and store manager for Jones & Laughlin Supply Co.

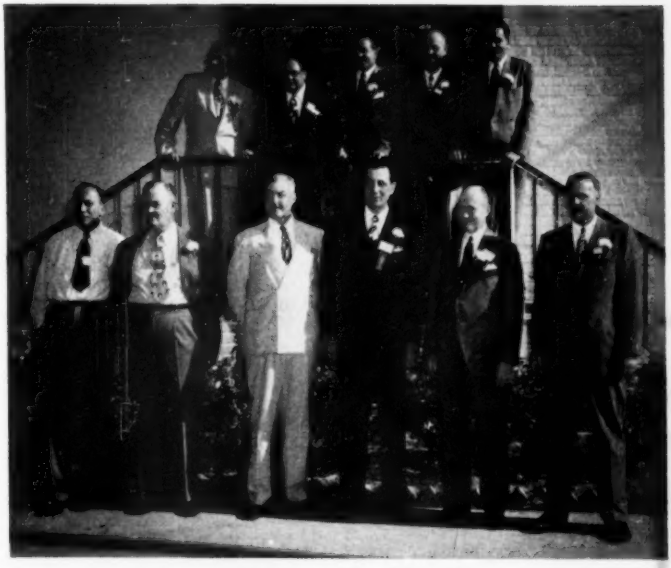
Sims and Gosa Named to Manage Continental Stores

Continental Supply Co. has announced the appointment of Conley H. Sims as manager of its Monahans, Tex., store, replacing P. D. Stearns, who has resigned. Ralph E. Gosa has been named manager of the Continental store in Seminole, Okla., replacing U. L. Harris, also resigned.

Grove Opens Tulsa Office

Grove Regulator Co., Oakland, Calif,. has announced the opening of a new sales office at Tulsa. The new office will operate as a subsidiary to the division office at Houston to further complement Grove's sales and service to the Mid-Continent and West Texas areas.

Dresser Industries Opens New Plant at Houston



Dresser officials and guests attending opening festivities at the new headquarters in Houston are: (top) Richard R. Bloss, vice president and general manager, Texas division, Ideco; C. P. Clark, president, Clark Brothers; Otto Hammer, president, Security Engineering; David K. Hutchcraft, vice president and director of sales, Clark Brothers; Ferguson Barnes, vice president and general manager, Columbus division, Ideco; (lower) F. W. Laverty, general sales manager, Clark Brothers; Robert M. Cook, vice president, Security Engineering; Warren S. Bellows, president, W. S. Bellows Construction Co. and president of Houston Chamber of Commerce; Thelmon D. Collins, vice president, supply stores division, Ideco; Oscar M. Havekotte, president and general manager, Ideco; and R. G. Ralph, Mid-Continent division manager, Kobe

Official opening of Dresser Industries, Inc., new division offices and service depot in Houston was held May 13 upon completion of the new facilities. The structure contains 6,000 sq. ft. of office space, all air conditioned, and 14,000 sq. ft. of warehouse facilities.

The plant will presently serve as the Gulf Coast headquarters for Dresser Industries, Inc., and five of its oil and gas equipment manufacturing subsidiaries: Clark Brothers Co., Inc.; International Derrick & Equipment Co.; Security Engineering Co., Inc.; Pacific Pumps, Inc.; and Kobe, Inc.

Under the supervision of F. H. Hayes, division manager, Clark Brothers will maintain a complete service and parts department, staffed by service engineers. Ideco will use the new headquarters for office space in the Houston area only. Louis R. Spencer will serve as Ideco district manager of stores division, and R. A. Feemster, technical service representative. Under the direction of John W. Stewart, Gulf Coast manager, Security Engineering will supplement from the new Houston office, service already available from Falfurrias, Tex., and Lafayette and Houma, La.

Pacific Pumps will use the new headquarters as a Gulf Coast sales office and will operate under the direction of W. R. Carlsen, Houston division manager. Kobe, under the direction of C. B. Buchner, district manager, will maintain district headquarters for the entire Gulf Coast area in the new building.

Indian Drilling Mud Opens Warehouse at Lamesa, Tex.

Indian Drilling Mud Co., Inc., Britton, Okla., has announced the opening of a warehouse location at Lamesa, Tex., where it will maintain a $25,000 stock of drilling muds, chemicals, and lost circulation materials.

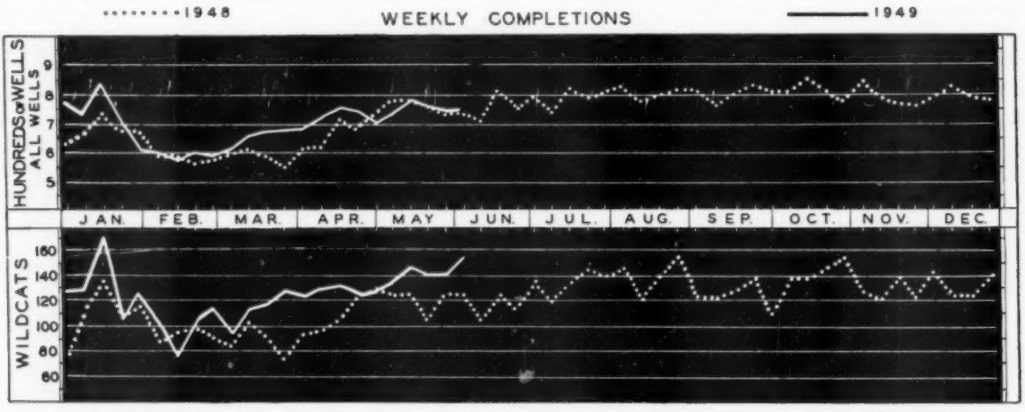
Teeters Joins Kellogg

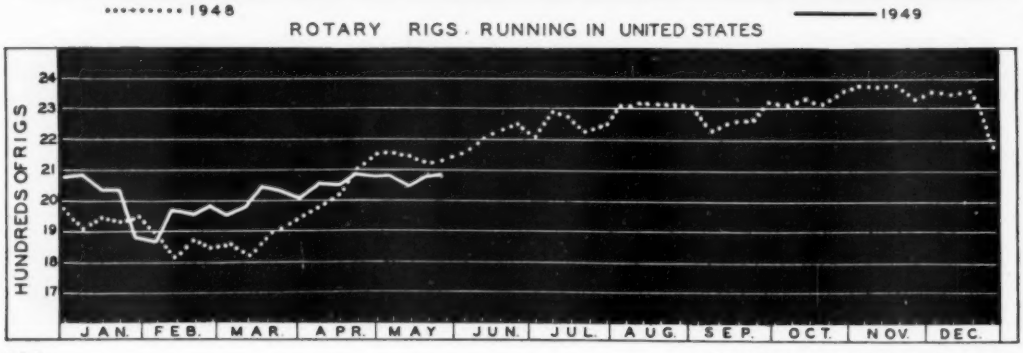
Wilber Otis Teeters has joined M. W. Kellogg Co. at the Jersey City laboratory of its petroleum and chemical research department. He is associated with product-development activities in the petroleum and chemical fields.

WEEKLY WELL COMPLETIONS . . . . . WEEK ENDED JUNE 4, 1949

	Total of all wells					22 wk.		Wildcat completions and discoveries										
													Cumulative total, 1949					
	Comp.	Oil	Gas	Dry	Footage	1949	1948	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	18	9	0	*9	19,047	507	642	0	0	0	0	0	0	0	0	0	0
Pennsylvania	29	12	6	†11	45,201	725	1,102	0	0	0	0	0	0	0	1	1	2
West Virginia	10	1	7	2	35,017	208	323	0	0	1	1	2	0	0	5	6	11
Ohio	23	6	9	18	43,336	453	530	0	0	0	0	0	1	0	2	18	21
Indiana	26	11	1	16	32,863	492	382	1	0	0	4	5	9	0	0	96	105
Kentucky	12	5	0	7	16,967	351	255	2	0	0	5	7	8	0	0	21	29
Illinois	54	30	0	24	170,167	904	607	2	0	0	8	10	18	0	1	155	174
Michigan	17	9	0	8	37,165	369	263	0	0	0	4	4	15	0	1	130	146
Kansas	57	31	4	22	189,481	1,225	1,169	1	0	0	12	13	22	0	2	158	182
Neb., Mo., Iowa	0	0	0	0	0	12	1	0	0	0	0	0	0	0	0	8	8
Oklahoma	97	51	4	§42	334,517	1,711	1,612	5	0	0	15	20	64	8	8	242	322
Texas	245	153	6	86	1,163,726	5,450	4,570	8	2	1	46	57	174	23	47	956	1,200
North Central (Dist. 7-B & 9)	61	30	1	30	212,262	1,762	1,413	3	0	0	12	15	81	0	8	376	465
West (Dist. 7-C & 8)	98	75	1	22	526,058	1,273	1,228	4	0	1	15	20	26	0	2	99	127
Panhandle (Dist. 10)	14	13	0	1	50,183	448	232	0	0	0	1	1	1	0	0	2	3
Eastern (Dist. 5 & 6)	8	5	1	2	39,539	291	205	0	0	0	1	1	1	1	3	60	65
Gulf Coast (Dist. 2 & 3)	32	21	1	10	187,255	806	740	1	2	0	7	10	34	17	22	167	240
Southwest (Dist. 1 & 4)	32	9	2	21	148,429	870	752	0	0	0	10	10	31	5	12	252	300
Louisiana	45	27	4	14	262,568	823	832	2	2	1	8	13	22	8	2	84	116
Northern	23	13	3	7	77,704	419	549	0	1	0	3	4	1	1	0	35	37
Southern	22	14	1	7	184,864	404	283	2	1	1	5	9	21	7	2	49	79
Arkansas	6	5	0	1	23,884	118	118	0	0	0	0	0	2	0	0	25	27
Mississippi	9	2	1	6	64,661	155	160	0	0	0	4	4	4	0	1	45	50
Southeastern States	1	0	0	1	3,051	22	19	0	0	0	1	1	1	0	0	20	21
Montana	2	1	0	1	15,288	82	100	0	0	0	1	1	1	0	1	9	11
Wyoming	8	4	0	4	47,210	238	177	1	0	0	1	2	11	0	0	42	53
Colorado-Utah	4	1	0	3	21,257	56	103	0	0	0	1	1	1	0	0	22	23
New Mexico	12	9	0	3	53,856	231	252	1	0	0	3	4	6	0	0	22	28
California	60	48	0	12	201,089	1,122	1,178	2	0	0	10	12	21	0	2	190	213
Total United States	737	415	42	280	2,800,441	15,254	14,595	25	4	3	124	156	380	39	73	2,250	2,742
Total previous week	735	403	54	278	2,555,177	14,517	13,855	21	2	5	113	141	355	35	70	2,126	2,586
Total June 5, 1948	740	420	64	256	2,597,390			20	2	10	91	123	324	29	116	1,946	2,415

Service wells included: *9, †11, ‡2, §1.





DAILY AVERAGE PRODUCTION FOR WEEK

	June 4 crude oil	B. of M. May demand	May 28 crude oil
Alabama	1,200	1,550	1,200
Arkansas	79,900	87,000	80,250
California	934,900	950,000	939,200
Colorado	66,200	62,000	66,100
Eastern	62,300	60,950	61,650
Florida	1,275	1,450	1,250
Illinois	176,400	165,000	177,000
Indiana	25,600	22,000	25,000
Kansas	289,250	300,000	285,950
Kentucky	24,300	21,000	24,200
Louisiana	505,475	492,000	502,250
North Louisiana	117,800	.....	117,650
South Louisiana	387,675	.....	384,600
Michigan	38,400	46,000	42,300
Mississippi	109,350	120,000	106,600
Montana	27,300	24,000	26,700
Nebraska	250	700	250
New Mexico	134,440	126,000	129,825
Oklahoma	425,050	410,000	430,150
Texas	1,897,975	2,300,000	1,884,600
Dist. 1 (Southwest)	25,925	.....	25,690
Dist. 2 (Southwest)	118,825	.....	118,675
Dist. 4 (Southwest)	185,150	.....	184,350
Dist. 3 (Gulf Coast)	356,200	.....	357,210
Dist. 5 (Eastern)	34,400	.....	34,475
Dist. 6 (Eastern)	83,375	.....	83,525
East Texas field	244,650	.....	247,400
Dist. 7-C (West)	42,175	.....	42,225
Dist. 8 (West)	525,325	.....	520,150
Dist. 7-B (W. Central)	58,575	.....	56,725
Dist. 9 (N. Central)	132,175	.....	125,400
Dist. 10 (Panhandle)	91,200	.....	88,775
Utah	500	350	350
Wyoming	124,900	130,000	121,300
Total United States	*4,924,965	5,320,000	4,906,125
Change from previous week, up 18,840			

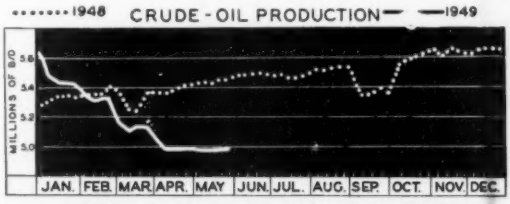
Total production January 1-June 4 ..... †809,505,960 bbl.
Same period last year (crude plus cond.) ..... 848,912,130 bbl.

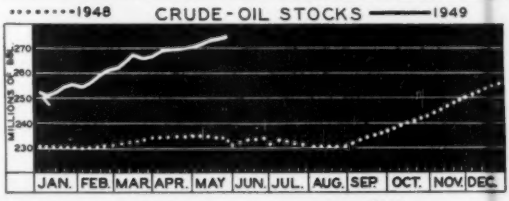
*Not including 80,315 bbl. condensate. †Including 13,113,250 bbl. condensate.

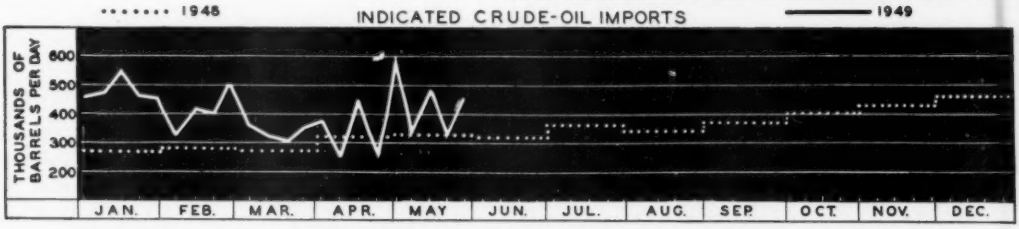
CRUDE STOCKS BY STATES OF ORIGIN

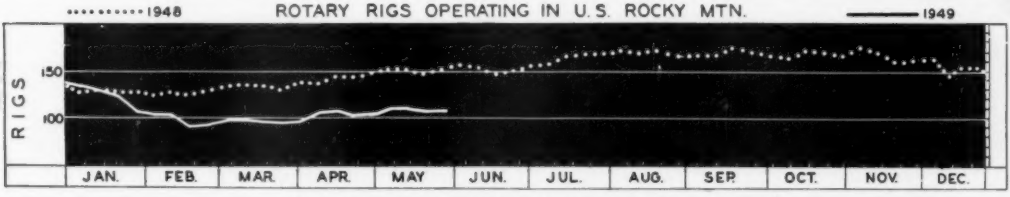
(Thousands of barrels)

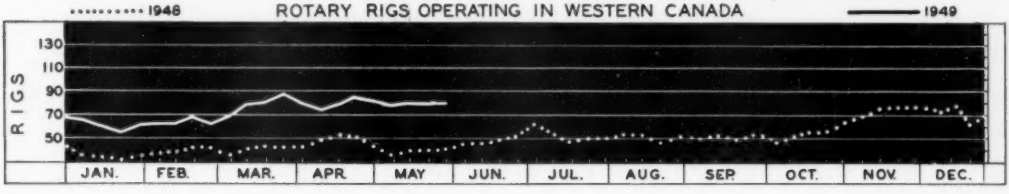
State of origin—	May 28, 1949	May 21, 1949	May 29, 1948
Pennsylvania Grade	3,102	3,133	2,634
Other Appalachian	2,030	2,134	809
Ind., Ind., Mich.	14,374	14,458	9,963
Arkansas	2,970	3,052	3,030
Louisiana	15,210	14,346	12,168
North	3,260	3,155	3,229
Gulf	11,950	11,191	8,939
Mississippi	3,339	3,321	2,555
New Mexico	7,404	7,319	5,221
Oklahoma and Kansas	39,673	39,597	33,810
Texas	129,861	129,686	113,211
East Texas	17,874	17,890	16,749
West Texas	51,848	51,752	42,714
Texas Gulf	31,231	31,369	29,026
Other Texas	28,908	28,675	24,722
Rocky Mountain	13,693	13,592	9,328
California	35,276	35,153	30,839
Foreign	8,258	8,251	5,411
Total United States	275,190	274,042	228,979











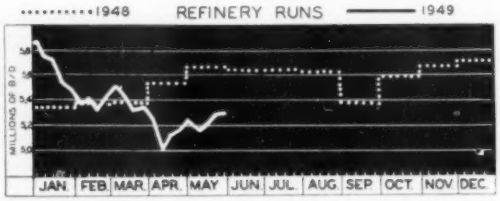
Refining Statistics

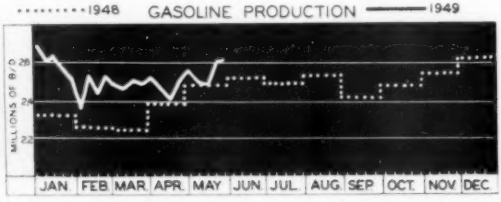
A.P.I. REFINERY REPORT, MAY 28

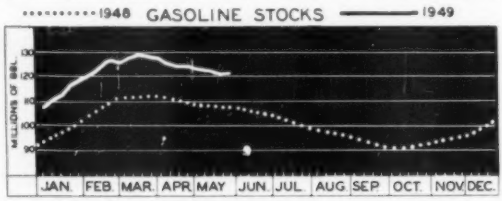
(Thousands of barrels)

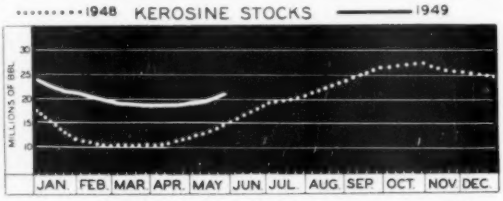
District--	Crude runs daily avg.	Daily average production				Stocks at refineries, bulk terminals, in transit and in pipe lines				Bureau of Mines, May 1948				
		Gasoline*	Kerosine	Distillate	Residual	Gasoline†	Kerosine	Distillate	Residual	Daily avg. crude runs	Daily average production			
											Gasoline*	Kerosine	Distillate	Residual
East Coast	725	328.6	23.2	151.7	158.9	28,269	9,437	19,408	10,407	895	304.3	47.3	158.8	244.3
Appalachian:														
District 1	100	41.3	3.0	13.1	12.8	2,591	383	725	519	99	40.9	7.9	11.3	11.6
District 2	54	30.9	2.1	2.4	10.4	1,178	131	212	309	68	33.8	2.9	6.7	15.7
Ind., Ill., Ky.	919	500.1	46.4	107.9	146.1	26,998	3,322	8,404	5,490	899	441.8	58.5	116.9	166.5
Okla., Kans., Mo.	417	219.0	23.7	70.1	57.7	11,730	1,228	3,993	2,403	453	223.8	25.0	82.7	73.2
Inland Texas	220	142.3	11.0	23.7	42.6	4,600	518	710	1,120	247	159.8	14.7	24.3	59.9
Texas Gulf Coast	1,234	627.7	62.0	220.3	231.6	17,153	2,675	9,026	7,790	1,436	629.8	97.3	306.6	273.7
La. Gulf Coast	391	197.1	25.7	91.2	35.1	5,701	1,863	3,219	2,122	437	190.1	43.7	94.4	73.3
N. La. and Ark.	84	32.1	6.3	12.3	20.7	2,434	443	918	239	77	27.1	7.5	13.9	18.0
Rocky Mountain:														
New Mexico	11	6.1		1.7	3.6	94	25	64	33	13	6.8	0.4	1.9	3.5
Other Rocky Mtn.	165	77.9	4.6	22.6	38.6	3,338	288	1,225	953	147	68.2	4.3	24.7	33.4
California	950	414.6	13.4	132.0	405.3	16,575	640	8,067	32,373	897	351.1	12.2	150.2	240.8
May 28, 1949‡	5,297	2,617.7	221.4	849.0	1,163.4	120,661	20,953	55,971	63,758	5,668	2,485.5	321.7	992.4	1,313.9
May 21, 1949	5,307	2,604.3	253.7	882.4	1,193.4	‡120,797	20,664	‡54,351	‡63,473					

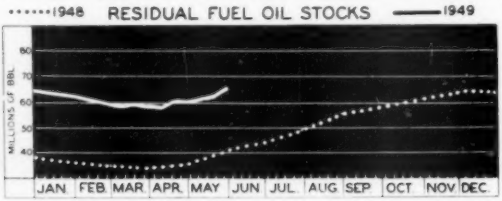
*At refineries including natural blended. †Finished and unfinished. ‡Comparable data for 1948 on new basis not available. §Revised.



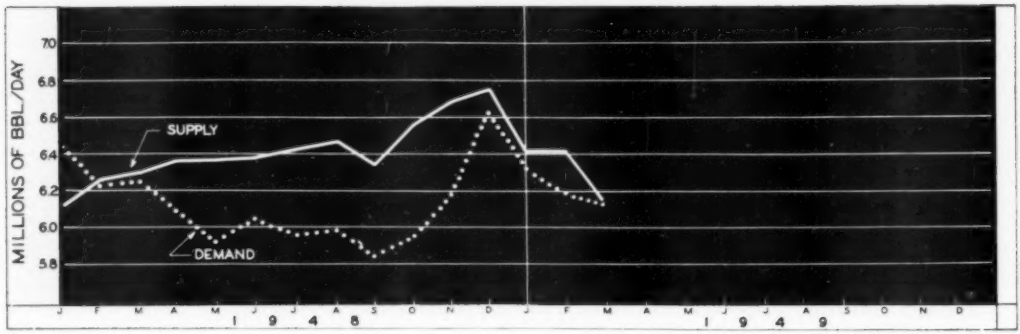








PETROLEUM SUPPLY AND DEMAND



CRUDE PRICES GRAVITY SCHEDULE

Gravity—	Signal Hill, Calif.	Oklahoma, Kansas	Gulf Coast Tex.*	West Tex.†
18-18.9	$1.78			
19-19.9	1.85			
20-20.9	1.93	$2.25		$2.12
21-21.9	2.00	2.27		2.14
22-22.9	2.07	2.29		2.16
23-23.9	2.13	2.31		2.18
24-24.9	2.20	2.33	$2.56	2.20
25-25.9	2.26	2.35	2.58	2.22
26-26.9	2.31	2.37	2.60	2.24
27-27.9	2.37	2.39	2.62	2.26
28-28.9	2.42	2.41	2.64	2.28
29-29.9	2.48	2.43	2.66	2.30
30-30.9	2.54	2.45	2.68	2.32
31-31.9	2.59	2.47	2.70	2.34
32-32.9	2.64	2.49	2.72	2.36
33-33.9		2.51	2.74	2.38
34-34.9		2.53	2.76	2.40
35-35.9		2.55	2.78	2.42
36-36.9		2.57	2.80	2.44
37-37.9		2.59	2.82	2.46
38-38.9		2.61	2.84	2.48
39-39.9		2.63	2.86	2.50
40 and above		2.65	2.88	2.52

*For crude from Daboval, El Campo, and Sand Point.

†Includes Lea County, New Mexico. Last general price change represented a 50-cent increase becoming effective December 6, 1947. Above changes do not include recent reductions of a few buyers applying principally to low-gravity grades.

FLAT CRUDE PRICES

Representative posted schedules per barrel.

East Texas†	$2.65
Kettleman Hills, California*	2.77
Beauregard Parish	2.60
Illinois Basin	2.77
Pecos County, Texas (Yates)	2.35
Bradford, Pennsylvania	3.27
Eastern Ill. and Western Ind.†	2.77
Tomball, Texas Gulf Coast	2.83

*37°-37.9°. †35° and above.

THE list of suppliers who are meeting Esso Standard Oil Co.'s program of summer-season protection for resellers of No. 2 heating oil continues to grow. Most of the announced plans differ slightly from the Esso's but in the end, all are designed to boost summer fill-up sales of No. 2 fuel to distributors, jobbers, and consumers. These plans will have their greatest effect in the high-demand areas of the North Central and East Coast districts but will also help to reduce refiners' stocks in the Southwest.

The need for some plan to boost summer purchases of home heating oils is shown by the slow movement of these oils since the end of March. In spite of reduced refinery runs and lowered distillate yields, the increase in distillate stocks for the past 8 weeks has been about 1,000,000 bbl. greater than last year.

In the Mid-Continent and North Central areas gasoline demand continues strong with markets firm. Refinery demand for these districts during the past 5 weeks has been 12 per cent above the same period last year compared with a 4.3 per cent gain in the national average.

In the New York Harbor area, suppliers report that it is too early to tell what effect the customer protection plans will have on summer sales of heating distillates but that inquiries are more numerous. Some sales of No. 2 were reported below 7 cents per gallon.

Standard Oil Co. of California reduced its price for heavy fuel oil by 15 cents per barrel for a total reduction of 60 cents since the first of the year. At the same time, Standard adjusted posted crude prices, paying more for high-gravity crudes and less for heavy crudes.

REPRESENTATIVE QUOTATIONS

Representative spot-market quotations of leading suppliers as of June 6, 1949. Figures are f.o.b. plant for tank-car shipment in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor (barge)	Tex. Gulf Coast
Regular gasoline, 73-75 octane	9⅝-9⅞	11.25-12	9½-10
Premium gasoline, 78-80 octane	10⅜-11	12.25-13	10½-11
42-44 w.w. kerosine	8-8½	8-8.4	7.50-8
No. 2 straw fuel oil	6¾-7	6.85-7.4	6⅜-6½
No. 6 residual	$0.85-0.90	$1.60	$1.15-1.25

NATURAL GASOLINE

	Group 3	North Texas	N. La.
Grade 26-70	5¼	4¾	5
Grade 18-55	6.3	5.7	6.0

LUBRICATING OILS
South Texas

200 vis., No. 2-3 neutral	11
750 vis., No. 3-4 neutral	14
2,000 No. 5-6 neutral	16-16.5

LUBRICATING OILS
Mid-Continent

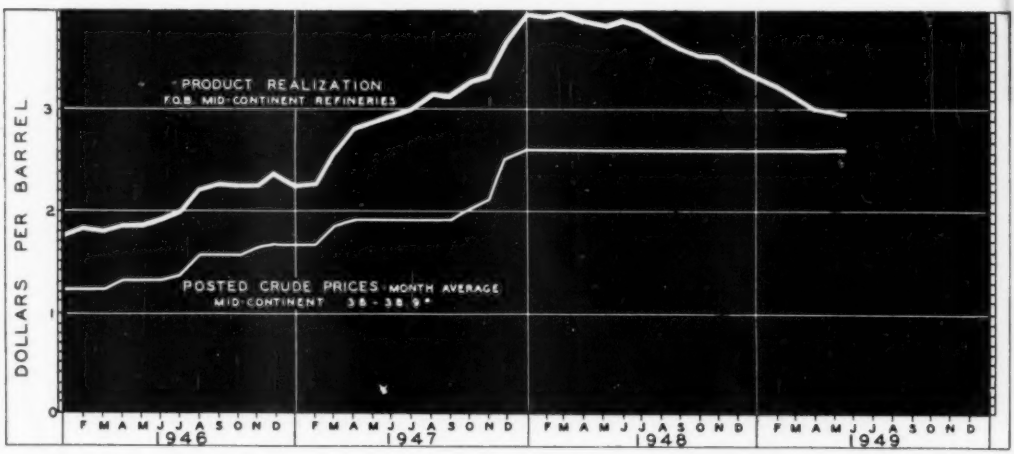
170-160 vis., D bright stock, 0-10 pp.	19
200 vis., No. 3 neutral, 0-10 pp.	12-14

Western Pennsylvania

144-155 vis., 10 p.t. bright stock	21.5
180 vis., 0 p.t. neutral	20.5

CRUDE-SCALE WAX
Mid-Continent

132-134 A.M.P.	4.75



The above chart is based on posted price for 38°-gravity crude and representative refinery yields which are confined to gasoline, kerosine, distillate, and residual fuel oil. Refinery prices used are the average of Group 3 quotations as published in The Oil and Gas Journal

Classified Advertising

The Market Place for the Oil Industry

UNDISPLAYED

All ads, 12 cents a word. Minimum charge, $3.00 per insertion.
Centered Line, any ad, $1.00.
Box Numbers count 9 words when replies are to be sent to our Tulsa Office. Replies forwarded without charge.

DISPLAYED, PER INCH

$12.00 per column inch per insertion. One-point border and 12-point capitals are allowed. Larger type sizes not accepted.

All classified advertising payable in advance.
10% Discount if 3 insertions are ordered at one time.
COPY DEADLINE, 9:00 a.m. Monday prior to each week's issue.

THE OIL AND GAS JOURNAL
P. O. Box 1260, TULSA, OKLAHOMA

EQUIPMENT FOR SALE

FOR SALE: Fifty, Sixty, and Eighty Thousand barrel tanks, good condition, knocked down or erected on your locations at attractive prices. Atlas Tank & Steel Company, Tulsa, Oklahoma.

FOR SALE: Sullivan #200, 1945 model, mounted on 1941 White truck. Rig in excellent condition, but drill pipe poor. Sale price $13,000. Phone 377-W, 932 Edwards, Midland, Texas.

FLAT MILD STEEL PLATE

80 pcs.—$\frac{5}{16}$" x 60" x 180"
80 pcs.—$\frac{1}{4}$" x 60" x 180"
275 pcs.—$\frac{3}{16}$" x 60" x 180"
245 pcs. $\frac{3}{8}$" x 60" x 180"
300 pcs. $\frac{7}{16}$" x 60" x 180"
150 pcs.—$\frac{1}{2}$" x 60" x 180"

Above ring plates available dismantled 55,000 barrel tanks, used good condition.

Priced low for quick delivery from Seminole, Okla., district.

HORWITZ PIPE & STEEL CO.
Ph. 2-9128 Tulsa, Okla.

EQUIPMENT FOR SALE

FOR SALE: Model "K" Cardwell, single drum draw works powered by G.A.K. Waukesha engine. Equipped with 98' "A" mast and sub skid. Priced for quick sale. Terms. Melton Supply Co., Seminole, Okla.

COMPLETE GENERATING PLANT
Two NT 128-BHP vertical natural gas engines and one 48-BHP, driving two GE 75-KW, 3-phase, 4-wire 120/208 volt, 60-cycle generators and one 30-KW, 3-phase generator respectively. Complete with switchboards and auxiliary equipment. Running and in good condition. Public Market, 311 So. Klein, Okla. City, Okla.

FOR SALE: Wilson Giant draw works, powered by 2—J.L.-1335 Buda engines and Wilson chain compound. Like new condition, with bargain price. Terms. Melton Supply Co., Seminole, Okla.

FOR SALE: 1 new patented Tom Dietle all steel, heavy duty casing pulling machine, 10" x 55' "A" mast—Double Drum—Double brake spudding attachment for ripping casing. I.H.C. motor, fully equipped, starter, 4-speed power transmission, also tools. Located Eureka, Kansas. Phone 1032, 917 North Elm or Tulsa: 2136 So. Yorktown. Phone 2-0061.

ROTARY equipment, almost new, only used few days, 1800' PK rods, Drill collar 30'x4¼" with 3½" box, King water swivel 1¼", PK slips, hoisting plugs, overshot. Complete outfit $4500, or will divide. We handle new and used spudders, rotaries, core drills, pipe, tools, cable. Fishing tools and equipment rented. Pressey & Son, Pueblo, Colo.

FOR SALE

Practically New Bethlehem S-40 Pulling Unit complete with all equipment, powered with 145-GKU Waukesha Engine—Bargain.

C. L. McMAHON, INC.
1605 National Bank of Tulsa Bldg.
Tulsa, Oklahoma

EQUIPMENT FOR SALE

FOR CABLE TOOLS
DEGEN PIPE AND SUPPLY CO.
Box 107, Red Fork Station, Tulsa, Oklahoma

BLOWOUT PREVENTER—10" Hinderliter type D.U. 4-M, 4½" rams, 6,000 lb. Year old, used 45 days—$1500. Shaleshaker, Thompson Model SR. Less sample machine. Used 30 days—$550.00. Midwestern Drillers, 816 North Grant, Liberal, Kansas. Phone 960.

SAVE WITH SAFETY—Very Good Used Wire Line—Any Size or Length up to 5,000' —Respooled for Your Inspection—Cable Tools for Sale. General Tool & Supply Co., P.O. Box 4387, Phone 61335, Oklahoma City, Okla.

FOR SALE—Franks Model FA with automatic chuck, complete with watertruck and all equipment. Mounted on late 2-ton trucks. Due to other interest will sell very reasonable. Box C-913, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE: Double drum heavy duty spudder, 6500 foot capacity, with telescoping mast with roller bearing sheaves, all mounted on steel skid. All tools for 7" and 5" casing, Kohler light plant, unitized forge on skid, large skid rack for moving all tools. Machine and tools in excellent shape. Everything rigged for quick moving. Ready to put to work. Price $12,500.00. Box C-857, The Oil and Gas Journal, Tulsa, Oklahoma.

NEW CENTRIFUGAL PUMPS
Byron Jackson—Aurora—Lombard—Gould —Hale — Gorman Rupp — Wayne & Novo, complete with engine power, also 1½ to 20 KW light plants. H. A. McCarthy, 310 Thompson Building, Tulsa, Oklahoma.

FOR SALE: Wilson Super Spudder—Double drum, double pole mast, complete with walk ways, roof, wings, and fully skidded—Good Wire—Priced to sell. Wilson Mogul Drawworks, powered by 145 GK Waukesha—Portable derrick—Wilson Snyder 6" x 16 pump, powered by WAK Waukesha—4½" Drill Pipe, Traveling Block, Swivel, 4¼" x 40' Kelly, BJ Tongs, etc.—Priced to sell. Write: T & R Oil Field Machine & Supply Co., Box 98, Carmi, Ill.

FOR SALE

3 Superior natural gas generating units complete with cubical generating panels. All of latest type and design. All 3-phase, 60 cycle, 480 volts, and with the following ratings:
1—685 Horsepower, 480 KW, 327 RPM.
1—510 Horsepower, 350 KW, 400 RPM.
1—365 Horsepower, 225 KW, 400 RPM.

K & L CONSTRUCTION & SUPPLY CO.
434 Mayo Building Phone 5-5639
Tulsa, Oklahoma

STEEL STORAGE TANKS

6—55,000 BBL.
2—18,000 BBL.
1—17,500 BBL.
4—5,000 BBL.

All dismantled suitable re-erection. Detailed specs. available. Priced low for prompt removal present locations Oklahoma, Kansas and Texas.

HORWITZ PIPE & STEEL CO.
Ph. 2-9128 Tulsa, Okla.

FOR SALE
NEW CASING AND LINE PIPE

25,000'	5½" 15½# 8RT J55 R2 API Smls. Casing
15,000'	7" 23# 8RT J55 R2 API Smls. Casing
6,000'	8⅝" 28# 8RT J55 R2 API Smls. Casing
4,641'	9⅝" 36# 8RT J55 R2 API Smls. Casing
7,015'	10¾" 40½# 8RT J55 R2 API Smls. Casing
19,000'	(893 Joints) 6" Std. Byer's Wrought Iron L.W. Plain End Pipe (ASTM A72-33)

Above subject to prior sale.

THE NATIONAL COOPERATIVE REFINERY ASSOCIATION
P.O. Box 770 McPherson, Kansas
Phone 820

FOR SALE OR TRADE FOR PROPANE

Twin Motored Beechcraft
Only 500 Hours

100 Hour Inspection Just Finished
Excellent Condition

BUPANE GAS CO.
Cedar Rapids, Iowa

EQUIPMENT FOR SALE

SPECIAL OFFER! Truck mounted portable rotary drilling rig, detailed information upon request. Priced for quick sale. Mechanical Equipment Co., 861 Carondelet Street, New Orleans, La.

FOR SALE: 100 hp. Allis-Chalmers electric motor, explosion proof, slip ring, new unused 3 hp., 500 v., 50 cy., 585 rpm., or 550 v., 60 cy., 700 rpm. $1800.00 f.o.b., Portland, Ore., A. Eckley, 1709 24th Ave., Longview, Wash.

FOR SALE: 6 Fairbanks-Morse ZC-118 engines, all in first-class condition. Lahoma Oil Corporation, 619 Leonhardt Building, Phone 7-1211, Oklahoma City.

FOR SALE: No. 3 National drilling machine, complete with shear poles, drilling motor, tools, cordage, house and floor. Many extra tools. Write for list of tools and equipment. Price $5500.00. Phone 2791, Box 87, Leon, Kansas.

FOR SALE at big discount: 5—New C. H. & E. Model 11 Triplex pumps powered by 5—New 100 HP Climax engines, Model N4B, $3000.00 each unit, complete. Also 5—portable C. P. 105 C air compressors at bargain. 1—100 HP LeRoi Motor. 409 Bewley Bg., Ft. Worth, Tex. 2-1620.

IMMEDIATE shipment two 500 hp. 1000 rpm. Winton GM diesels. Four 330-400 hp. 1800-2000 rpm. new GM twin diesels. Two 165-200 hp. 1800-2000 rpm. new GM single diesels. One 12 KW Superior diesel generator 115v DC. Holliday Motors, Indianapolis 7, Indiana.

MANUFACTURERS LATEST DESIGN

Hydraulic Casing Pulling Units. Complete line of equipment. Units made to your specifications. Truck Mountings or Skid Units. Repair Service and Parts.

OKLAHOMA MACHINE & SUPPLY CO.
Ada, Oklahoma

PACKAGED H_2S REMOVAL UNITS

We offer prompt shipment on skid-mounted hydrogen sulfide removal units for treating sour gas for pipe line or fuel gas purposes.

GRAFF ENGINEERING & EQ'PT. CO.
3415 Westminster, Dallas 5, Texas

STEEL STORAGE TANKS

Railroad Tank Car Tanks
6,500 to 12,000-Gal. Cap.
Coiled and Non-Coiled
Cleaned—Painted—Tested
Heavier—Safer—Cheaper
Other Tanks Too
Also—Complete Tank Cars
8,000 and 10,000-Gal. Cap.

Your Inquiries Solicited

NEWHALL-MARSHALL-WOOD, INC.
30 Church Street, New York 7, N. Y.
Phone: COrtlandt 7-8090

COMPLETELY EQUIPPED
NEW HERCULES RXC
Gasoline Engines

Price of engines, with full equipment, is $1250 . . . . less than usual cost of engine alone! PROMPT SERVICE IS ASSURED THROUGH NATIONAL FIELD ORGANIZATION.

Engine rating, 110 H.P. at 1800 r.p.m. Equipment includes: cast iron radiator; starter; Twin Disc clutch power take-off; heavy metal housing; all power controls; etc.

Wire or write
Box C-945, The Oil and Gas Journal, Tulsa, Oklahoma

EQUIPMENT FOR SALE

FOR SALE: 30'x40'x12' Stefco Sectional Steel Corrugated Iron Boiler House. Erected in the Seminole Field. $850.00. Cities Service Oil Co., Patridge, Bartlesville, Okla.

FOR SALE: One new Cabot electric pumping outfit complete, motor. Sacrifice. G. H. Samples, 209 Pennsylvania Avenue, Charleston, W. Va. Phone 3-6524.

FOR SALE: Rotary Mast Pole. 1—8" x 10" x 87' Two Leg Mast Pole with 5—24" Roller bearing sheaves in crown. 98'—¾" Raising Line and 110'—⅛" Telescope line. 1200'—9/16" Guywires and 160'—⅞" Guywire. 1—4000' Double Board. 1—30' Main Skid with upright supports for Mast and well for Rotary table. Denman Drilling Company, Phone 4033, Wichita Falls, Texas.

FOR SALE: 1—10¾" SDA Cameron Blowout Preventer—4,000# Test with 4½" and 3½" Rams. 1—10¾" SDA Cameron Master Valve 4,000# test. 1—10¾" Regan Pressure Operated Blow-out Preventer—6,000" test. 1—Fluid End for 7¼ x 14P Oilwell Pump. 2—Thompson SRF Shale Shakers. 1—Link-Belt Shale Shaker powered by Wisconsin Motor. 2—Basch-Ross 2RBS4—RB4½" Kelley Drives. 1—6,000' Measuring line with Reel. 1—C-36 Chrysler Industrial Engine—Skid Mounted. 1—Brewster Coring or Swabbing Unit, 10,500' Capacity 9/16, Powered by 6MZR Waukesha Motor. 1—4½" x 41' Basch-Ross Square Kelley with Rathole—Actually Drilled 19,000' hole. 2,985'—4½" O.D. 16.60# Drill Pipe with Hughes Acme F.H. Joints Regular. Box and Pins all in good condition. 3,868'—4" O.D. 15.70# Drill Pipe with Hughes 5½" API F.H. Joints, Bottle-Neck. Actually Drilled 16,000' of hole. 3—30' x 6¼" Basch-Ross Drill Collars with Safety Clamps, Slips & Subs—Actually Drilled 19,000' of hole. 1—Conventional Core Barrel. 1—American Overshot and Slips. 1—Set 4½" Web-Wilson Elevators. Most of these items were purchased new slightly more than a year ago. Will sell any portion or trade equitably for good used Lee C. Moore Cantilever Derrick with Sub-Structures, power pump, medium size power drawworks, pulling unit, etc. Better deal cash for all. Sale of all items subject to prior consideration.

WILLIAMS DRILLING COMPANY
P.O. Box 772, BATON ROUGE, LOUISIANA
PHONES 3-1901 or 3-1754
NIGHT PHONE 2-3086

BUCYRUS-ERIE 36L Spudder—A-1 condition. Will sell with or without complete set of tools, including complete set of casing tools. L. H. Bebout, Route 3, Newark, Ohio.

FOR SALE

12—230 H.P. Type 10 Bessemer New 17" Power Cylinders complete ready to run with 16" to 18" Compressors. 1—230 H.P. Clark Horizontal with Compressors. Located Salem, Illinois.

ENGLE PETROLEUM, Incorporated
Box 655, Evansville, Indiana

Several Army Surplus 4½" x 6" Gaso Duplex 1860 Pumps—two piece skid mounted with Chrysler 8 cylinder engines. Will sell pumps only or complete units about half price.

H. H. COFFIELD
ATTN: W. H. Orr
Phones: 132—Rockdale, Texas
A-86064—Houston, Texas

6" STD. LINE PIPE

42,500' 6⅝" O.D., 18.97# Lapweld, 40 ft. random lengths, plain ends beveled, used, good condition. Priced low, immediate delivery from East St. Louis, Ill.

HORWITZ PIPE & STEEL CO.
Ph. 2-9123 Tulsa, Okla.

FOR SALE

10 Sterling Viking engines. Can supply generators. These engines suitable for generator or pump drives of following ratings for continuous service:

RPM	HP	KW
600	190	125
720	225	150
900	285	190

K & L CONSTRUCTION & SUPPLY CO.
434 Mayo Building Phone 5-5639
Tulsa, Oklahoma

EQUIPMENT FOR SALE

FOR SALE: Buda heavy duty jacks, Model #2815-B; fifteen ton capacity, twenty-eight inch rise, toe and top lift, mechanical ratchet type, automatic lowering device, complete with crowbar handle. New, priced less than half. Box C-941, The Oil and Gas Journal, Tulsa, Oklahoma.

EQUIPMENT WANTED

WANTED: 4 miles each 6" O.D. and 4" O.D. invasion pipe; also desire victaulic couplings. Box C-938, The Oil and Gas Journal, Tulsa, Oklahoma.

HELP WANTED

WANTED: Experienced oil field equipment salesman with practical experience background on spudders and cable tools for sales position with nationally known oil field equipment manufacturer. Box C-904, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED
EXPERIENCED PETROLEUM ENGINEER

Specializing in study of OIL and GAS RESERVES. To head reserve section large independent oil company. Location, Tulsa, Oklahoma. Give full particulars as to personal history, academic qualifications, practical experience, references, and salary expected. All communications confidential.

Box C-933, The Oil and Gas Journal, Tulsa, Oklahoma

ENGINEERING

During the next several months we will increase our Engineering Organization engaged in the design of Oil Refinery Plants and Power Plants. Location Cleveland, Ohio. The men we need should be qualified as draftsmen, designers, checkers or in higher engineering skills on design of piping, instrumentation, pressure vessels, structural steel, concrete, mechanical or electrical. For presenting your qualifications and prompt consideration, write to us for application form.

ARTHUR G. McKEE & CO.
2300 Chester Ave., Cleveland 1, Ohio

MARKETING EXECUTIVE

Major oil company has opening for executive who can initiate and develop sales distribution of natural gasoline and liquefied petroleum gas. Good salary and fine opportunity for right man.

Chemical engineering background desirable. Must be thoroughly experienced in marketing of these products.

All replies will be kept confidential. Furnish complete particulars in letter of application.

BOX C-942
THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

HELP WANTED

NEW Directory of 140 large oil companies in U.S. 10 of them having foreign operations, showing where to apply for jobs. Price $5.00 postpaid. Oil Industry Mailing List, Box 2603, Tulsa, Okla. (our 29th year).

WAX SALES EXECUTIVE

Nationally prominent petroleum company can offer an exceptional opportunity to a top-flight technical sales executive who by education and experience is qualified to direct the marketing of large quantities of wax in all channels of sale.
Applicants should write, giving complete information regarding background, education, experience, and compensation desired, first letter. Reply to

Box C-943, The Oil and Gas Journal, Tulsa, Oklahoma

ASPHALT EXECUTIVE

Large oil company, not now in road and industrial asphalt business, desires executive capable of developing this field from standpoint of manufacturing, research, and sales operations. Unusual opportunity, with good salary and other benefits.
Besides sales engineering ability, this executive must be familiar with the chemistry of asphalt, and know specifications and manufacturing techniques of the product. All replies in strict confidence. Give full information with application.

BOX C-947
THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

SITUATIONS WANTED

REFINERY MANAGER: M. S. in Ch. E., age 35, registered Texas engineer, thorough knowledge refining, now manager small Texas refinery. Desire new connection. Available short notice. Box C-930, The Oil and Gas Journal, Tulsa, Oklahoma.

SALES REPRESENTATIVE: 40 years old. Graduate Petroleum Engineer. Good record of achievement. Well known to Oil Circles on the Gulf Coast and in Southwest Texas. 15 years experience engineering and managing Sales direct and through distributors to the Production, Drilling, Pipe Line and Natural Gas and Gasoline Industries. Live in San Antonio prefer to headquarter there and work Southwest Texas. Available immediately. Can furnish top flight references. Box C-922, The Oil and Gas Journal, Tulsa, Oklahoma.

SENIOR PETROLEUM ENGINEER: Now in semi-executive position major oil company with wide experience in all phases petroleum engineering, geology, well completions, and supervisor of field operations. Age 38. Desires opportunity with smaller producing company. Record on request. Box C-927, The Oil and Gas Journal, Tulsa, Oklahoma.

EXECUTIVES ATTENTION: If you need a man of excellent legal background with broad land, exploration and production experience write Box C-936, The Oil and Gas Journal, Tulsa, Oklahoma.

LANDMAN: Diversified experience in Gulf Coast, West Texas, Rockies and Canada. Legal background. Box C-937, The Oil and Gas Journal, Tulsa, Oklahoma.

ENGINEER: B.S. in Petroleum Engr. 5 years varied refinery and gasoline plant experience including laboratory, drafting, construction, process design, specification writing. Registered Oklahoma Engineer. Box C-948, The Oil and Gas Journal, Tulsa, Oklahoma.

ROYALTIES

DEEDED ROYALTIES
San Juan Basin & Permian Basin. Write Harry S. Wright, Wright Bldg., Farmington, New Mexico.

WILL BUY FEE LANDS, producing royalties or mineral prospects. Submit offerings in detail to Box 546, Thibodaux, Louisiana.

ROYALTIES IN HOT AREAS!
Recent strikes have focused attention on Montana's deeper oil zones and major companies are moving fast, drilling and leasing. We buy direct in the field, sell direct to our customers. Write LANDOWNERS ROYALTIES COMPANY, Box 1225, Great Falls, Montana.

PRINCIPAL WILL BUY: Group of producing oil royalties and group of producing gas royalties, $5,000.00 to $50,000.00 worth. Send price and monthly income past twelve months to: Box C-949, The Oil and Gas Journal, Tulsa, Oklahoma.

LEASE AND DRILLING BLOCKS

I HAVE $200,000 worth of new California residential income property. Will trade in on settled production anywhere in U. S. May add cash if the deal is right. N. G. Snyder, 434 South Irving Blvd., Los Angeles 5, Calif.

OIL LEASE six miles southwest "Golden Spike Schoeppe" well. Drilling commitment on 50-50 basis. $13,000.00. Ida A. Cole, 10160—94A Street, Edmonton, Alberta, Canada. Phone 24044.

CHOICE Drilling Blocks to deal to responsible parties, moderate drilling depths, in Western Nebraska and Eastern Wyoming. Kimball Development Co., P.O. Box 1002, Kimball, Nebraska.

OIL LEASES for sale in large, small or medium size blocks in Colorado, Wyoming, New Mexico, Montana, Arizona. Wholesale or retail. Write for descriptive list. Dyer-OJ, 1835 Champa, Denver, Colorado.

FOR SALE: Oil and Gas Leases and drilling propositions in shallow territory of Allen, Simpson, and Warren Counties, Kentucky. W. P. Harley, Bowling Green, Ky.

FOR LEASE for oil and gas—acreage in Brazoria County near Angleton, Texas. Write E. Hufford, Box 633, Boulder City, Nevada.

SOUTHEASTERN NEW MEXICO: For Sale—Oil leases and royalties in North Lea and Eastern Chaves Counties. Grant Keyes, 311 White Bldg., Roswell, New Mexico.

MONTGOMERY COUNTY, MISSISSIPPI, on the ideal shoreline structure, where the sands are thicker and much more favorable for petroleum accumulation. 145 acres on SEISMOGRAPH HIGH adjoining Highway and Railroad 31-19-7 on DOME outstanding Kilmichael structure. Four sands to 3,500 feet. If no oil will deed you land. Opportunity: 1369 Court, Memphis, Tennessee.

FOR SALE: SHALLOW production in Southeast Kansas. 30 bbl. per day, never water flooded, also gas production sufficient for nearby town with 260 customers. Gas franchise just renewed for 20 years. Above production and franchise for sale. Good water-flood prospects. Box C-944, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE: About 40 bbl. daily settled shallow sand production, full $\frac{7}{8}$ lease, Houston, Texas, area. $30,000. L. H. Vinnedge, Country Campus, Texas.

WE BUY Salvage Oil Properties and small production. Ben H. Rosenthal, 1901 Republic Bank Bldg., Dallas, Texas.

LEASES ROYALTIES

PRODUCING OR NONPRODUCING

Texas, New Mexico, Oklahoma, Louisiana and Illinois

Inquiries Invited

B. D. BUCKLEY

60 Broadview Drive, Clayton (5), St. Louis, Missouri

LEASE AND DRILLING BLOCKS

PROVEN and semi-proven shallow leases to let on farm out basis. Sands from 500 to 1,900 feet. W. H. Mahon, Brownwood, Texas.

WHY DRILL DRY HOLES?
Do You Want a Proved Oil Lease?
I will drill first well for you on my acreage, at my own risk and expense. J. H. Walker, Geologist. Box 427, Coffeyville, Kansas.

We are offering for sale 45 barrel gross daily production water flood project in Elk County, Kansas. 33 gravity. Complete details available. Cities Service Oil Company, attention H. D. Patridge, Bartlesville, Oklahoma.

NEW MEXICO OIL

Sub-surface map covering Major Structure Chaves County, NW of Cross Roads field. Structural control and Major Co. support indicates another large potential field. Rig erected to drill 6000' cutting all oil zones and Upper Pennsylvania. Maps & lease data on request. We specialize in areas under Major Co. operation.

W. J. PETERMAN, GEOLOGIST
Portales, New Mexico

PATENT ATTORNEYS

PATENT Practice before U. S. Patent Office. Validity and Infringement investigations and Opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommell, Registered Patent Attorneys, Suite 418, 815-15th Street, N.W., Washington 5, D. C.

WANTED

GASOLINE Connection Wanted: Wish to contract for six million gallons a month for 1 year at market price. No brokers. Will deal with principals only. P.O. Box 481, Beaumont, Texas.

LEGAL BLANKS

BURKHART LEGAL BLANKS since 1908. Oil-Gas (all states), Business, Real Estate, Legal Forms, Leases, Revised With Government Regulations, Commercial Printing, Catalog and Samples on request. Burkhart Printing & Stationery Company, 115 South Cincinnati, Tulsa 3, Oklahoma.

SERVICES

PECOS DRILLING COMPANY, INC.
DRILLING CONTRACTORS "Cable Tools"
302 CARPER BUILDING, TELEPHONE 649
ARTESIA, NEW MEXICO

FOR SALE

FOR SALE OR CHARTER

Boat 65 ft. by 18 ft.; 165 G.M. Diesel; wood; rigged nicely for geophysical exploration work; approximately 1,000 gallons fresh water; Koehler electric plants; refrigerator and deep freezer; innerspring mattresses; awning over working area aft. Vessel and equipment slightly over a year old. Worked since completion as survey boat for oil company engaged in geophysical exploration work in Gulf.

Also other boat suitable for offshore exploration work.

H. P. McHUGH
Morgan City, Louisiana

LEGAL

U. S. DEPARTMENT OF THE INTERIOR. Bureau of Land Management, Washington 25, D. C. Notice is hereby given that the lands listed herein are offered through sealed bids on the terms hereinafter specified, to qualified bidders of the highest cash amounts per acre as a bonus for the privilege of leasing the lands under sec. 17 of the Leasing Act of February 25, 1920 (41 Stat. 437; 30 U.S.C. sec. 181), as amended. All bids must be submitted to the Director, Bureau of Land Management, Washington

25, D. C., on or before 1 p.m. of the date set out herein. Each bidder must submit with the bid one-fifth of the amount bid in cash or by certified check on a solvent bank or by money order made payable to the order of the Treasurer of the United States, and file the showing of qualifications to receive a lease required under 43 CFR 192.42 (b) and (c). The envelopes should be plainly marked that they are not to be opened before the date and hour set out herein, and should show the number of the parcel and the name of the field. No bids received after the hour fixed herein for receiving bids will be considered. The remainder of the bonus and the annual rental must be paid and an acceptable surety bond in the sum of at least double the amount of rental, but in no case less than $1,000 nor more than $5,000, must be furnished by a successful bidder prior to the issuance of a lease. An acceptable $5,000 surety bond will be required prior to commencing drilling operations on the land. The deposits of the other bidders will be returned upon acceptance of the successful bids. Bidders are warned against violation of section 59, U.S. Criminal Code, approved March 4, 1909, prohibiting unlawful combination or intimidation of bidders. The right is reserved to reject any and all bids. Royalties payable to the United States will be at the rate of 12½ per cent to 25 per cent for oil, and 12½ per cent to 16⅔ per cent for gas, in accordance with Schedule B in the lease form. Annual rental will be at the rate of $1.00 per acre. The lands are in the known geologic structure of the Half Moon Field and are offered in the following parcels, all in T. 51 N., R. 102 W., 6th P.M., Wyoming: Parcel No. 1, sec. 14, SW¼SW¼; sec. 15, SE¼SE¼; sec. 22, lot 1, 119.92 acres. Parcel No. 2, sec. 26, N½NE¼, SE¼NE¼, 120 acres. Total 239.92 acres. Bids must be submitted on or before 1 p.m., daylight saving time, June 22, 1949, and must be submitted on each parcel separately, but no objection will be made to the award of both parcels to the same successful bidder. Marion Clawson, Director.

LEGAL

Department of the Interior, Wind River Indian Agency, Fort Washakie, Wyoming, May 27, 1949. Notice is hereby given that SEALED BIDS will be received until 2:00 P.M., June 27, 1949, and opened at that time in the Office of the Superintendent of the Wind River Indian Agency, Fort Washakie, Wyoming, for the leasing of the following tract of Tribal Indian land for oil and gas mining purposes: Township 3 North, Range 1 West, WRM, Section 33—SE¼; Section 34—S½ S½, containing 320 acres. The foregoing tract of Tribal land is being offered, and a lease will be drawn on the applicable Government form. The right is reserved to reject any and all bids. The successful bidder will be required to pay the cost of the advertisement. The lessee must pay as advance rental $1.25 per acre per annum. The lease will be sold to the highest bidder for a bonus offer upon an acreage basis in addition to the royalty of 12½%. The successful bidder must deposit with the Superintendent of the Wind River Agency, on the date of the sale, a certified check or bank draft on a solvent bank in an amount equal to 20% of the bonus bid and of the first year's rental, as a guaranty of good faith, the check to be made payable to the TREASURER OF THE UNITED STATES. The lease must be completed and filed with the Superintendent within 20 days from the date received by the lessee for execution and returned with the remainder of the bonus bid, the balance of the first year's rental, and a filing fee of $10. Failure in any of these conditions may subject the bid to cancellation without further notice and forefeiture of payment already made. The lease will be drawn pursuant to the Act of May 11, 1938, (52 Stat. 347), and the regulations, Part 186, Title 25, C.F.R. The lease issued pursuant to this notice will be made for a term of ten years from the date of approval by the Commissioner of Indian Affairs, and as long thereafter as oil and/or gas is produced in paying quantities. The rate of royalty will be 12½% of the value of all oil, gas and/or natural gasoline, unless the lessor, with the approval of the Secretary of the Interior, elects to take royalty in kind. The adequacy of the bonus offer will be determined by the Geological Survey. A suitable bond will be required, and such bond must be approved by the Department. The responsibility of complying with any requirements of the Federal Documentary Stamp Statutes will be left with the successful lessee. All bids should be addressed to the Superintendent, Wind River Indian Agency, Fort Washakie, Wyoming, in a plain envelope marked: BID FOR OIL AND GAS MINING LEASE, SOUTH PILOT BUTTE FIELD, TO BE OPENED JUNE 27, 1949. For further information, call or write the Land Division of the Wind River Agency. J. M. Cooper, Superintendent.

LEGAL

U. S. DEPARTMENT OF THE INTERIOR, Bureau of Land Management, Washington, 25, D.C. Notice is hereby given that the lands listed herein are offered through sealed bids on the terms hereinafter specified, to qualified bidders of the highest cash amounts per acre as a bonus for the privilege of leasing the lands under sec. 17 of the Leasing Act of February 25, 1920 (41 Stat. 437; 30 U.S.C. sec. 181), as amended. All bids must be submitted to the Director, Bureau of Land Management, Washington 25, D. C., on or before 1 p.m. of the date set out herein. Each bidder must submit with the bid one-fifth of the amount bid in cash or by certified check on a solvent bank or by money order made payable to the order of the Treasurer of the United States, and file the showing of qualifications to receive a lease required under 43 CFR 192.42 (b) and (c). The envelopes should be plainly marked that they are not to be opened before the date and hour set out herein, and should show the number of the parcel and the name of the field. No bids received after the hour fixed herein for receiving bids will be considered. The remainder of the bonus and the annual rental must be paid and an acceptable surety bond in the sum of at least double the amount of rental, but in no case less than $1,000 nor more than $5,000, must be furnished by a successful bidder prior to the issuance of a lease. An acceptable $5,000 surety bond will be required prior to commencing drilling operations on the land. The deposits of the other bidders will be returned upon acceptance of the successful bids. Bidders are warned against violation of section 59, U.S. Criminal Code, approved March 4, 1909, prohibiting unlawful combination or intimidation of bidders. The right is reserved to reject any and all bids. Royalties payable to the United States will be at the rate of 12½ per cent to 25 per cent for oil, and 12½ per cent to 16⅔ per cent for gas, in accordance with Schedule B in the lease form. Annual rental will be at the rate of $1.00 per acre. The land is offered in one parcel described as the W½ sec. 35, T. 30 N., R. 113 W., 6th P.M., Wyoming, 320 acres, within the known geologic structure of the Big Piney Field. Bids must be submitted on or before 1:00 P.M., Daylight Saving Time, June 29, 1949. Marion Clawson, Director.

LEGAL

U. S. DEPARTMENT OF THE INTERIOR, Bureau of Land Management, Washington, 25, D.C. Notice is hereby given that the lands listed herein are offered through sealed bids on the terms hereinafter specified, to qualified bidders of the highest cash amounts per acre as a bonus for the privilege of leasing the lands under sec. 17 of the Leasing Act of February 25, 1920 (41 Stat. 437; 30 U.S.C. sec. 181), as amended. All bids must be submitted to the Director, Bureau of Land Management, Washington 25, D. C., on or before 1 p.m. of the date set out herein. Each bidder must submit with the bid one-fifth of the amount bid in cash or by certified check on a solvent bank or by money order made payable to the order of the Treasurer of the United States, and file the showing of qualifications to receive a lease required under 43 CFR 192.42 (b) and (c). The envelopes should be plainly marked that they are not to be opened before the date and hour set out herein, and should show the number of the parcel and the name of the field. No bids received after the hour fixed herein for receiving bids will be considered. The remainder of the bonus and the annual rental must be paid and an acceptable surety bond in the sum of at least double the amount of rental, but in no case less than $1,000 nor more than $5,000, must be furnished by a successful bidder prior to the issuance of a lease. An acceptable $5,000 surety bond will be required prior to commencing drilling operations on the land. The deposits of the other bidders will be returned upon acceptance of the successful bids. Bidders are warned against violation of section 59, U.S. Criminal Code, approved March 4, 1909, prohibiting unlawful combination or intimidation of bidders. The right is reserved to reject any and all bids. Royalties payable to the United States will be at the rate of 12½ per cent to 25 per cent for oil, and 12½ per cent to 16⅔ per cent for gas, in accordance with Schedule B in the lease form. Annual rental will be at the rate of $1.00 per acre. The land is offered in one parcel described as the E½SE¼ sec. 35, T. 24 S., R. 36 E., N.M.P.M., New Mexico, 80 acres and is within the known geologic structure of the Cooper Field. Bids must be submitted on or before 1:00 P.M. Daylight Saving Time, June 29, 1949. Marion Clawson, Director.

Senators Seek Curbs On Trade Pact Powers

WASHINGTON. — The recent sharp contraction of domestic industry is serving to strengthen a move in the Senate to limit the President's authority in the making of reciprocal trade agreements.

The first move in that direction was taken last month by Sen. Elmer Thomas of Oklahoma, who proposed an amendment to the bill extending the Reciprocal Trade Act to revive the quota provision originally applied to oil when it was first included in the trade agreement with Venezuela. That amendment would limit imports of all petroleum to not exceeding 5 per cent of our domestic requirements in normal times.

Later in the month, Chairman Wright Patman of Texas and Rep. E. J. Keough of New York of the House small business committee held hearings at Dallas at which operators and state oil officials called for legislation limiting oil imports.

Last week Sen. George W. Malone of Nevada introduced legislation which he said he would offer as an amendment to the extension bill, setting up a flexible import-fee system.

Malone's bill would make the present rates of import duty the basic rates, instead of those in the 1930 Tariff Act, on which reciprocal trade concessions have been granted, and would reorganize the Tariff Commission as the Foreign Trade Authority to administer the trade agreements.

All existing trade agreements would be terminated at the earliest date provided therein but without any change in the import duties, and a system would be set up for periodic adjustment of duties to "provide for fair and reasonable competition between domestic articles and like or similar foreign articles in the principal markets of the United States."

Imports would be considered as providing fair and reasonable competition to domestic producers if authority found as a fact that the landed duty-paid price "is a fair price, including a reasonable profit for the domestic producers, at which the like or similar domestic articles can be offered to consumers of the same class by the domestic industry."

The authority also would be empowered to impose quantitative limits upon the importation of any foreign commodity, in such amounts and for such periods as it finds necessary for the protection of domestic industry.

ADVERTISERS IN THIS ISSUE

American Air Filter Company, Inc. 133
American Hoist and Derrick Co. 135
American Iron & Machine Works 90
American Manganese Steel Division 126
Anchor Petroleum Company 52
Autocar Company, The 11
Axelson Manufacturing Company 37
Baker Oil Tools, Inc. 54
Bethlehem Supply Co. 1
Black, Sivalls & Bryson, Inc. 9, 10
Bovaird Supply Co., The 31
Boyd Company, Inc., The Clarence L. 154
Brewster Company, Inc., The 32
British Oilfield Equipment Co., Ltd. 38
Cameron Iron Works, Inc. 153
Carter Company, Ralph B. 126
Chapman Valve Mfg. Co., The 25
Chicago Bridge & Iron Company Inside Front Cover
Chrysler Corporation, Dodge Division 18
Classified Advertising 162, 163, 164, 165
Continental Motors Corp. 45
Continental Supply Co., The 77
Cooper-Bessemer Corp., The 73
Crane Co. 5
Crose Manufacturing Company, Inc., M. J. 114
Crutcher-Rolfs-Cummings 112
Cummins Sales & Service, Inc. 95
Darling Valve & Mfg. Co. 46
Dean Brothers Pumps, Inc. 151
Diamond Alkali Company 28
Dowell Incorporated 107
Dragon Mfg. Co. 132
Eagle-Picher Lead Co. 136
Empire Trust Company 138
Emsco Derrick & Equipment Co. 77, 78
Falstrom Company 108
Four Wheel Drive Auto Co., The 34
General American Transportation Corporation 130, 131
General Electric Company 14, 15
Globe Steel Tubes Co. 22
Goodrich Company, B. F. 3
Grancell, I. H. 116
Graver Tank & Mfg. Co., Inc. 33
Gunite Concrete & Construction Co. 109
H & M Pipe Beveling Machine Co. 114
Haering & Co., Inc., D. W. 127
Hinderliter Tool Co., Div., H. K. Porter Company, Inc. 117
Hughes Tool Co. Back Cover
Hunt-Spiller Manufacturing Corporation 93
Industrial Engine Division, Chrysler Corporation 29
International Nickel Company, Inc., The 100
Jones & Laughlin Supply Co. 19
J P Machine & Tool Company 148
Keasbey & Mattison Company 48
Kinzbach Tool Company, Inc. 151
Latex Construction Company 113
Lummus Co., The 35, 36
Manning, Maxwell & Moore, Inc. 151
Marman Products Co., Inc. 139
Martin Iron Works 120
Mayes-Bevan Company 118
McCullough Tool Company 98
McKee & Company, Arthur G. 42
McKissick Products Corporation 145
Milton Roy Company 109
Minnesota Mining & Mfg. Co. 24
Mission Mfg. Co. 87
Moore Corporation, Lee C. 149
Morse Chain Company 20
"M" System Manufacturing Company 21
Murphy Diesel Company 7
Murray Rubber Co. 140
National Airoil Burner Co., The 109
National Supply Co., The 84, 85
Nordstrom Valve Division, Rockwell Manufacturing Co. 40, 41
Norris Brothers, Inc. 146
Norris Manufacturer, Inc., W. C. 50
Oakite Products, Inc. 129
Oil Center Tool Co. 122, 123
Oshkosh Motor Truck, Inc. 23
Owens-Corning Fiberglas Corporation 16, 17
Paddock Sales of Texas 132
Peerless Pump Division of Food Machinery and Chemical Corp. 154
Penberthy Injector Co. 108, 114, 116, 128, 132, 135
Pennsylvania Flexible Metallic Tubing Company 6
Perrault Brothers, Inc. 113
Petroleum Distributing Co. 117
Petroleum Electric Power Assn. 44
Pipe Line Service Corp. 113
Pittsburgh Plate Glass Company, Industrial Paint Div. 26
Post Company, The Frederick 12
Pritchard & Co., J. F. 13
Rector Well Equipment Co., Inc. 120
Reed Engineering Co. 154
Reed Roller Bit Company Front Cover
Republic Rubber Division of Lee Rubber & Tire Corp. 49
Rig-A-Lite 117
Ross-Martin Co. 132
Schlumberger Well Surveying Corp. 4
Skinner Company, M. B. 112
Smith Corporation, A. O. 47
Standard Oil Company of Indiana 43
Standco Brake Lining Co. 132
Star Drilling Machine Company, The 128
Taylor Forge & Pipe Works 102
Taylor Instrument Companies 30
Thomas Flexible Coupling Co. 125
Thornhill-Craver Co. 115
Timken Roller Bearing Company 8
Toro Mfg. Corporation 146
Trackson Company 2
Tri-State Oil Tool Co. 124
United States Treasury Dept. 111
United Supply & Manufacturing Co. 39
Viking Pump Co. 129
Visco Products Co., Inc. 67
Washington Engine & Pump Co. 146
Waterman Engineering Company 133
Well Equipment Mfg. Corp. 137
Wheatley Pump & Valve Mfr., Frank 139
Wheland Company, The 121
Wilson Manufacturing Co., Inc. 27
Worthington Pump & Machinery Corp., Centrifugal Pump Division 96
Youngstown Sheet & Tube Co. Inside Back Cover

CALENDAR OF EVENTS

June

Society of Automotive Engineers, summer meeting, French Lick Springs Hotel, French Lick, Ind., June 5-10.

National Oil Scouts and Land Men's Association, annual meeting, Shamrock Hotel, Houston, June 9-11.

Western Petroleum Refiners Association, joint regional technical-industrial relations meeting, Broadview Hotel, Wichita, June 10.

Canadian Gas Association, annual convention, Bigwin Inn, Lake of Bays, Ont., Canada, June 16-20.

Pennsylvania Grade Crude Oil Association, annual meeting, Hotel William Penn, Pittsburgh, Pa., June 16-17.

American Society for Testing Materials, fifty-second annual meeting, Hotel Chalfonte Haddon Hall, Atlantic City, N. J., June 17-July 1.

Kentucky Oil & Gas Association, annual meeting, Hotel Lafayette, Hotel Phoenix, Lexington, Ky., June 23-24.

American Society for Testing Materials, fifty-second annual meeting, Chalfonte-Haddon Hall, Atlantic City, June 27-29.

American Society of Mechanical Engineers, semiannual meeting, University of California Extension Building, San Francisco, June 27-30.

August

United Nations Scientific Conference on the Conservation and Utilization of Resources, U. N. Interim Headquarters, Lake Success, N. Y., August 17-September 6.

September

Interstate Oil Compact Commission, summer quarterly meeting, Stanley Hotel, Estes Park, Colo., September 1-3.

Instrument Society of America, annual meeting and exhibit, Municipal Auditorium, St. Louis, September 12-16.

National Petroleum Association, Hotel Traymore, Atlantic City, N. J., September 14-16.

American Gas Association, annual convention, Chicago, September 17-20.

American Institute of Chemical Engineers, Mt. Royal Hotel, Montreal, September 18-20.

American Association of Oilwell Drilling Contractors, ninth annual meeting, Baker Hotel, Dallas, September 19-21.

National Butane-Propane Association, Jefferson Hotel, St. Louis, September 19-21.

Mid-Continent Oil and Gas Association, twenty-seventh annual convention, Louisiana-Arkansas division Roosevelt Hotel, New Orleans, September 22-23.

American Institute of Mining and Metallurgical Engineers, regional meeting, Neil House, Columbus, Ohio, September 25-28.

American Society of Mechanical Engineers, fall meeting, Erie, Pa., September 28-30.

October

American Society of Mechanical Engineers, petroleum division, 1949 Petroleum Mechanical Engineering Conference, Biltmore Hotel, Oklahoma City, October 2-5.

National Association of Corrosion Engineers, South-Central Regional Division, annual meeting, Adolphus Hotel, Dallas, October 3-4.

National Lubrication Grease Institute, Hotel Roosevelt, New Orleans, La., October 3-5.

American Institute of Mining & Metallurgical Engineers, Petroleum Branch, fall meeting, Plaza Hotel, San Antonio, October 5-7.

American Society for Testing Materials, first Pacific area national meeting, Hotel Fairmont, San Francisco, October 10.

Texas Mid-Continent Oil and Gas Association, annual meeting, Rice Hotel, Houston, October 13-14.

American Gas Association, annual convention, Chicago, October 17-20.

American Institute of Mining & Metallurgical Engineers, Petroleum Branch, fall meeting, Elk's Club, Los Angeles, October 20-21.

Independent Natural Gas Association of America, annual meeting, Baker Hotel, Dallas, October 31.

November

American Petroleum Institute, annual meeting, Stevens Hotel, Chicago, November 7-10.

American Society of Mechanical Engineers, annual meeting, Hotel Statler, New York, November 27-December 2.

December

American Institute of Chemical Engineers, annual meeting, William Penn Hotel, Pittsburgh, Pa., December 4-7.

NOMADS

Houston Nomads, second Monday of each month, Ye Olde College Inn, Houston.

Los Angeles Nomads, second Wednesday each month, Jonathan Club.

Water-Flood Permit Given

AUSTIN. — Permission has been granted W. E. Butler, Edgar Davis, and George B. Rice by the Texas Railroad Commission to flood their C. C. Roberts lease, Corsicana Shallow field in Navarro County.

TABLE OF CONTENTS ON PAGE 53

America Needs '49ers

JUST a hundred years ago, the Forty-niners stormed the gold fields of California. They faced staggering obstacles, sure hardship, uncertain reward. Thousands failed, thousands of others realized modest gain, a few made fortunes. None sought or received help or direction from a benevolent government.

Now a century later, America faces another age of golden opportunity--an era when science and industry reveal new treasure to be had for the making. Turning today's visions into reality calls for '49ers--men of purpose and resolution, courage and independent spirit. You as a leader in your community may find a personal challenge and an inspiration in the Old '49er. By example and precept, you can help America toward her greatest accomplishments--in prosperity and peace.

The Youngstown Sheet and Tube Company

General Offices--Youngstown 1, Ohio
Export Offices--500 Fifth Avenue, New York

MANUFACTURERS OF CARBON, ALLOY AND YOLOY STEELS

ELECTROLYTIC TIN PLATE - COKE TIN PLATE - WIRE - COLD FINISHED CARBON AND ALLOY BARS - PIPE AND TUBULAR PRODUCTS - CONDUIT - RODS - SHEETS - PLATES - BARS - RAILROAD TRACK SPIKES.

What makes a Rock Bit great?

Drillers say...

Through the years, Hughes Rock Bits have been first choice with drillers the world over. Free-cutting, smooth-running action on bottom plus proven ability to "take it" means faster, more trouble-free digging with fewer round trips per hole.

From the grass roots to total depth, there's a Hughes Rock Bit designed to do the job best . . . to provide a Hughes "Engineered Solution" for any drilling formation encountered!

HUGHES TOOL COMPANY
HOUSTON, TEXAS

Standard of the Industry